STEEL

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

Contents

Vol. 101-No. 17 **October 25, 1937**

READER COMMENTS 11

AS THE EDITOR VIEWS THE NEWS 15

NEWS

- National Metal Congress and Exposition 17
- P. G. Lang Heads Welding Society 19
- New Divisions in Wire Association 19
- A.I.M.E. Sessions Well Attended 20
- Highlights of Exposition 20
- Europe Feels Check in Steel 21
- Freight Advance Expected To Aid Buying 23
- Steelworks Operations for the Week 23
- Foundry Equipment Orders 72 Per Cent Over 1936 25
- Machine Tool Dealers Discuss Sales 25
- Steel Founders Oppose Wages-Hours Bills 25
- Men of Industry 26
- Hopeful Sentiment for 1938 at Hardware Conventions 26
- Meetings 27
- Obituaries 29

MIRRORS OF MOTORDOM 31

WINDOWS OF WASHINGTON 35

EDITORIAL—Public Opinion Will Support Prompt Action on Two Correctives 37

THE BUSINESS TREND

- Market Crash Will Test Industry's Resistance to Shock 38
- Charts and Statistics 38-39

TECHNICAL

- Manufacture of Chilled Iron Rolls 40
- Technical Sessions, Society for Metals 43
- Report of Welding Society Meetings 46
- Porcelain Enamel Institute Meets 70
- Fume Elimination Is Subject of Study 72
- Report of Wire Association Meeting 74

MATERIALS HANDLING

- Variety of Devices in Motors Plant 49

WELDING, ETC.—*Robert E. Kinkead* 56

POWER DRIVES 58

SURFACE TREATMENT AND FINISHING OF METALS

- Color Standardization Aids Retailers 62

PROGRESS IN STEELMAKING

- Unusual Features in Rod Mill Drive 66

NEW EQUIPMENT 75

RECENT PUBLICATIONS OF MANUFACTURERS 78

MARKET REPORTS AND PRICES 79

- The Market Week 80

BEHIND THE SCENES 92

CONSTRUCTION AND ENTERPRISE 100

INDEX TO ADVERTISERS 106

EDITORIAL STAFF

E. L. SHANER
Editor-in-Chief

E. C. KREUTZBERG
Editor

A. J. HAIN
Managing Editor

E. F. ROSS
Engineering Editor

D. S. CADOT
Art Editor

ASSOCIATE EDITORS

G. H. MANLOVE — J. D. KNOX
W. L. HAMMERQUIST — J. A. CRONIN
F. E. GOODING — R. L. HARTFORD

New York
I. H. SUCH — B. K. PRICE
L. E. BROWNE

Pittsburgh: D. R. JAMES
Chicago: W. G. GUDE
Detroit: A. H. ALLEN
Washington: L. M. LAMM

London
VINCENT DELPORT

BUSINESS STAFF

G. O. HAYS
Business Manager

C. H. BAILEY
Advertising Service

New York . E. W. KREUTZBERG, B. C. SNELL
Pittsburgh . . S. H. JASPER, D. C. KIEFER
Chicago . . . L. C. PELOTT, W. F. O'DELL
Cleveland . . . R. C. JAENKE

R. T. MASON, *Circulation Manager* — J. W. ZUBER, *Readers' Service*

BRANCH OFFICES

New York . . . . . 220 Broadway
Chicago . . . Peoples Gas Building
Pittsburgh . . 1650 Koppers Building
Detroit . . 1010 Stephenson Building
Washington . National Press Building
Cincinnati . . . 418-420 Sinton Hotel
San Francisco . . . 2413 Milvia St.
Berkeley, Calif., Tel. Berk. 7354-W
London . . . . . Caxton House
Westminster, S. W. 1
Berlin . Berlin, N. W. 40, Roonstrasse 10

• • •

Published by THE PENTON PUBLISHING CO., Penton Building, Cleveland, Ohio. JOHN A. PENTON, Chairman of Board; E. L. SHANER, President and Treasurer; J. R. DAWLEY and G. O. HAYS, Vice Presidents; F. G. STEINEBACH, Secretary.

Member, Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers' Association.

Published every Monday. Subscription in the United States, Cuba, Mexico and Canada, one year $4, two years $6; European and foreign countries, one year $10. Single copies (current issues) 25c.

Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879.

Copyright 1937 by the Penton Publishing Co.

PRODUCTION · PROCESSING · DISTRIBUTION · USE

When a noted Los Angeles manufacturer struck a sour note in his production of musical instruments, Ludlum engineers were called in. The trouble involved hardened mandrels and dies for drawing slender tubes of high nickel alloy. The stock had a wall thickness of .07" and was to be drawn in some cases to .007". The surface of the drawn tubes had to maintain a glass finish. A section of each tube had to be fluted longitudinally. No satisfactory die for the job had been found, and the mandrels just would not remain straight—until Ludlum took hold. A hard, tough alloy, machined and treated as recommended by Ludlum metallurgists, was put to work. Dies now retain their size and finish for long periods and with no trouble. The new mandrels remain straight and are made for *one third of the former cost.*

THE HIGH NOTE IN *Custom Made* QUALITY

● Craftsmanship of the highest order enters into fine musical instruments and the fine steels used in their manufacture. The perfect tonal quality of many of these instruments is made possible through the use of Ludlum steels—because both instruments and steels are made by experts to the most exacting requirements.

Ludlum engineers fit the steel to the individual job—and stay with it until the finished product is completely satisfactory to the customer and to themselves in every way. This Ludlum service is gladly extended to you, without expense or obligation. When you need expert advice on your steel problems, simply write to Research Dept., Ludlum Steel Co., 1025B Street, Watervliet, N.Y.

An illustrated booklet, "Performance" presents typical examples of Ludlum Service, Unlimited, and its part in speeding the progress of modern industry.
Use the coupon to get your free copy.

LUDLUM STEEL COMPANY, Research Dept.,
1025 B Street, Watervliet, N. Y.

Please send me a copy of the Ludlum booklet, "Performance", free of charge.

*Name*_____
*Firm*_____
*Address*_____

LUDLUM

FINE STEELS SINCE 1854

TOOL · STAINLESS · CARBON · ALLOY

As the Editor Views the News

THINK what we will of last Tuesday's sorry spectacle, when investors competed with one another in the wholesale dumping of securities at distress prices, the fact remains that that severe and probably largely unnecessary purge has cleared the air considerably. No one knows specifically what caused the debacle, but at the same time no one denies that it was a warning—uttered by the combination of subtle forces which govern mass opinion—that something was wrong in our economic system. The more buoyant sentiment that has prevailed since the crash is a reflection of hope, if not belief, that this warning will be heeded.

• • •

One place where it should be heeded is Washington. Congressmen will do well to check into the effect of some of the laws they passed recently. Are these laws working exactly as they had intended? How about the tax on undistributed profits? The treasury says it has yielded less revenue than expected. In industry (p. 37), it has caused confusion and worked hardships on small companies. How about the Wagner act? Has it worked according to plan? In fact, hasn't it failed of its purpose, at the same time actually curbing operations and reducing employment? These laws should be modified at the approaching session.

Modify Shot-Gun Legislation

• • •

While Wall Street was staging its show, thousands of engineers and technical men were attending their annual conventions. It is more than a coincidence that one of the subjects which bobbed up persistently in many of the technical programs was the necessity of reducing operating costs. Technicians, automatically directing attention to a vital problem in their field of activity, were discussing means of offsetting one of the threatening factors, i.e. runaway costs, at the same time the stock market's plunge was warning the nation of danger—one of the danger points obviously being abnormally high costs. One who reads the accounts of the meetings of the American Society for Metals (pp. 17, 43), American Welding society (p. 46), Wire association (p. 74), Porcelain Enamel institute (p. 70), Eastern States Blast Furnace and Coke Oven association (p. 72) and others will note the underlying emphasis on cost reduction.

Stress Economy In Conventions

• • •

The same theme was outstanding in the National Metal show. If an observer were to analyze the sales approach employed by the 230 exhibitors of the really remarkable displays of materials, equipment and supplies in Atlantic City's spacious auditorium (p. 20), he would find that an overwhelming emphasis is placed upon cost saving. Saving to offset pyramided increases in wages, or in raw materials, or in the burden of taxes, social security deductions, etc., or to compensate for the added expense of adhering to restrictive laws on hours, working conditions, etc.! Conventions, shows, the stock market—in fact, all events which reflect mass opinion—indicate that business is engaged in a tremendous defensive campaign to protect itself from newly imposed oppressive burdens.

Cut Costs Is Sales Approach

• • •

Isn't it about time that we in this nation quit kidding ourselves about the social benefits presumed to be derived from some of the recent shotgun legislation? Can't we be fair enough to admit that some of the acts intended to promote industrial peace and to help employment in effect have promoted labor warfare and made it increasingly difficult for average or below-average workmen to get jobs? Aren't we big enough to admit that the law penalizing undistributed profits is a ghastly mistake? Isn't it about time that we admit that badgering industry, choking off private initiative, and riding the hobby horse of an economy of scarcity are destructive policies?

Why Continue To Fool Selves

E. L. Shaner

RYERSON *Certified* STEELS

RYERSON R CERTIFIED STEELS

Meet Definite Specifications — Pass Rigid Inspections

Ryerson Certified Steels are the result of many years of planning,—developing new specifications, new methods of control and complete readjustment of stocks. Definite specifications and rigid inspection systems now assure the qualities most desired in each class and type of material. Special handling and warehousing methods protect these qualities and make possible immediate shipment of every requirement—large or small.

Let us give you the complete story of Ryerson *Certified* Steels. Write for booklet H4.

JOSEPH T. RYERSON & SON, Inc., Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City

RYERSON STOCKS INCLUDE:

- Alloy Steels—Tool Steels
- Heat Treated Alloy Steel Bars
- Stainless Steel
- Hot Rolled Bars—Hoops and Bands
- Cold Finished Shafting and Screw Stock
- Extra Wide Cold Finished Flats
- Beams and Heavy Structurals
- Channels, Angles, Tees and Zees
- Rails, Splices, Spikes, Bolts, etc.
- Plates—Sheets
- Strip Steel, Flat Wire, etc
- Boiler Tubes and Fittings
- Welding Rod—Mechanical Tubing
- Rivets, Bolts, Nuts, Washers, etc.
- Reinforcing Bars
- Babbitt Metal and Solder

RYERSON STEEL-SERVICE

Metal Congress and Exposition Attract 10,300; Reflect Progress in Industry

VENTURING away from a large industrial center proved to be no obstacle to success of the nineteenth annual national metal congress and exposition which was held in Atlantic City, N. J., Oct. 18-22. Choice of the convention city placed a certain restriction on general registration; nevertheless, the thousands who attended were of a preferred classification, having deep-rooted interest in the metal producing and working industries.

Except for the 1926 exposition in Chicago, and the one of 1927 in Detroit, the Atlantic City show was the largest of the 19 which have been held. The two earlier expositions, however, included machine tools and machinery, which now are exhibited in a separate show. This year's exposition, with 80,000 square feet of floor space and 230 exhibitors, was 10 per cent larger than the 1936 show in Cleveland with 70,000 square feet and 210 exhibitors. Total registration for the week was 10,300.

Chief sponsor and originator of the congress and exposition was the American Society for Metals. Co-operating in the programs of technical meetings were the American Welding society, American Institute of Mining and Metallurgical Engineers, American Society of Mechanical Engineers, and the Wire association.

Included in the program of the American Society for Metals were 14 technical sessions, the annual business meeting, the Campbell Memorial lecture, a five-period lecture course on steelmaking, a three-period course on metallographic technique, and the annual banquet. All meetings were well attended.

Some 200 persons were enrolled in the five-period lecture course and about 300 in the three-period course. This is the fourth year that the society has conducted educational activities during the convention. These courses have become a permanent part of the convention.

The lectures on steelmaking were presented by Earnshaw Cook, American Brake Shoe & Foundry Co., Mahwah, N. J.; the metallographic technique lectures by J. R. Vilella, United States Steel Corp., Kearny, N. J.

About 850 members attended the society's nineteenth annual meeting at the Ambassador hotel, Wednesday morning. President Edgar C. Bain, assistant to vice president,

Capacity of the Ambassador hotel ballroom was taxed to the limit Wednesday morning when 850 members of the American Society for Metals convened for the annual business meeting and Campbell Memorial lecture. Seated in the front row of the right section, left to right, are H. M. Boylston, chairman for the lecture; W. P. Sykes, lecturer; E. C. Bain, retiring president; and G. P. Waterhouse, president-elect. Immediately behind Prof. Waterhouse are W. P. Woodside, vice president-elect, at the left; and W. H. Eisenman, secretary, at the right

United States Steel Corp., New York, presided.

President Bain reported that the society is completing the most successful year in its history with increased membership, substantial gain in revenue and broader activities. Seven new chapters and groups were established in the last 12 months, raising the total from 42 to 49. A new and revise dedition of the *National Metals Handbook* is under preparation and will be issued in 1938. Dr. Bain commented on the wide range of educational activities pursued by most chapters; during the past year more than 4000 members of the society were enrolled in lecture courses.

Announcement was made by President Bain that no recipient of the Albert Sauveur Achievement award would be named this year, because of a change in procedure to permit more time for considering candidates. The award established in 1934 in honor of the widely known metallurgist to recognize outstanding contributions to metallurgical knowledge.

Membership Reaches New High

In his report as treasurer, W. B. Woodside, vice president, Climax Molybdenum Co., Detroit, stated that the society has just completed the most satisfactory financial year in its history, having substantially strengthened its position. Secretary W. H. Eisenman, Cleveland, reported that the society has reached a new high in membership with a total of 10,068, a gain of nearly 2500, or 30 per cent, over the 7600 on the rolls one year ago. This increase was the largest for any year in the society's history. Membership is now two and one-half times that in 1932.

Mr. Eisenman announced that F. M. Reiter, Dayton Power & Light Co., Dayton, O., was a special guest during convention week in recognition of his having completed 10 years' service as secretary of the Dayton chapter. Last year, six chapter secretaries were recognized similarly.

The 1938 Metal congress and exposition will be held in Detroit, Oct. 17-21, it was revealed by Mr. Eisenman.

The Robert M. Bird bell and gavel, awarded annually to the chapter which had performed outstanding work and been of most service to the national society in the past year was presented by President Bain to the Philadelphia chapter. Educational work of notable character was the basis of the award. W. B. Coleman, a past chairman of the chapter and past national president, accepted the bell.

New officers nominated last spring were declared elected and assumed

George B. Waterhouse

Elected president of the American Society for Metals

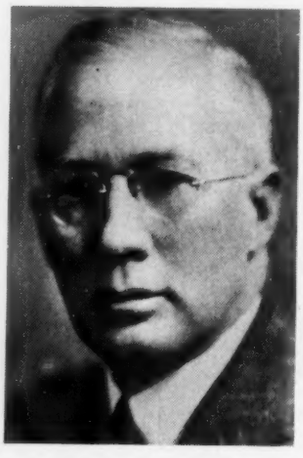
their positions at the close of the convention. George B. Waterhouse, professor of metallurgy, Massachusetts Institute of Technology, Cambridge, Mass., became the new president, succeeding Dr. Edgar C. Bain, assistant to vice president in charge of metallurgy, United States Steel Corp., New York.

W. P. Woodside, vice president, Climax Molybdenum Co., Detroit, succeeded Prof. Waterhouse as vice president, Dr. Bradley Stoughton, dean of engineering, Lehigh univercity, Bethlehem, Pa., was elected to the post of treasurer for two years, succeeding Mr. Woodside who served in that capacity for a similar period.

New Trustees Elected

Two new trustees, elected to two-year terms, are James P. Gill, metallurgist, Vanadium-Alloys Steel Co., Latrobe, Pa., and Harvey Anderson, metallurgical engineer, Western Electric Co., Chicago.

The board for the coming year will comprise the new officers, trustees and the following: Trustee Owen W. Ellis, director of metallurgical research, Ontario Research Foundation, Toronto, Ont.; Trustee Ralph L. Wilson, metallurgical engineer, Climax Molybdenum Co., Canton, O.; Retiring President, Dr. Bain, and Secretary William H. Eisenman, Cleveland.



T. M. Jackson

Awarded Lincoln Gold Medal by American Welding society

At the close of the annual meeting, Wesley P. Sykes, metallurgical engineer, Cleveland Wire Works, General Electric Co., Cleveland, presented the 1937 Edward De Mille Campbell memorial lecture. He was introduced by Prof. H. M. Boylston, head of the department of metallurgy, Case School of Applied Science, Cleveland. Formal title of the lecture was "Structural and Hardening Characteristics of Some Iron-Cobalt-Tungsten Alloys."

Well-known in research circles for his many years of work and numerous published investigations in iron-tungsten and iron-cobalt alloys, Mr. Sykes turned to the ternary system of alloys—iron, tungsten and carbon—and drew an analogy between these carbon-free alloys and the alloys of iron and carbon as far as rates and types of reaction between the constituents after cooling were concerned.

Studies Effects of Cobalt

Starting with equilibrium structures of iron-tungsten alloys as a basis, Mr. Sykes showed how numerous studies were made under his supervision involving the addition of varying percentages of cobalt, up to 30 per cent. Comparison of hardnesses in as-quenched specimens and hardnesses of the same after aging were presented, as well as results of dilatometric examinations, microcharacter hardness determinations and X-ray photographs.

Further experiments were made on iron-tungsten-cobalt alloys containing small amounts of chromium, nickel and vanadium, and hardness tests were conducted on alloys heated to elevated temperatures in the vicinity of 700-800 degrees Cent.

In describing the analogy between the iron-carbon alloys and his ternary alloys, Mr. Sykes pointed out that in the former the "urge to age" is so great that aging starts at once, a feature that is not characterisic of the nonferrous alloys but which is exhibited to a remarkable degree by the iron-tungsten-cobalt system.

Mr. Sykes amplified his discussion with a number of excellent photomicrographs which showed at various magnifications the structures obtained under different conditions of heating and quenching.

Approximately 400 members of the society and their guests attended the banquet Thursday evening at the Ambassador hotel. President Bain presented the Past President's

medal to R. S. Archer, chief metallurgist, Chicago district, Republic Steel Corp. who served as president in 1935-36.

President Bain presented the Henry Marion Howe gold medal to A. G. H. Andersen, research department, Phelph-Dodge Corp., New York, and Eric R. Jette, associate professor of metallurgy, school of mines, Columbia university, New York. This medal is awarded for the best paper published in the society's Transactions in the year preceding the year of the annual convention. The contribution which won the award for the authors was "X-Ray Investigation of the Iron-Chromium-Silicon Phase Diagram." It was published in the June, 1936, Transactions.

P. G. Lang Heads Welding Society

LARGER attendance and more comprehensive exhibits than ever before featured the eighteenth annual meeting of the American Welding society in Atlantic City, Oct. 18-22.

An increase in the number of local sections from 12 to 23 and a gain of nearly 100 per cent in membership, indicating widespread industrial acceptance of welding, was reported by Alfred E. Gibson, president, Wellman Engineering Co., Cleveland, retiring president of the society.

E. G. Budd, president, E. G. Budd Mfg. Co., Philadelphia, guest speaker at the opening session, reviewed some of the early pioneering work in welding.

A proposed amendment to the constitution by which a sub-body of the society will be named to act jointly with other engineering associations, government agencies and others interested in welding research was ratified.

H. Sidney Smith
Awarded Samuel Wylie Miller medal by American Welding society

Philip G. Lang Jr.
Elected president, American Welding society

Revised welding symbols with instructions for their use have been adopted by an increasing number of users, including various departments of the United States navy. These have been offered the American Standards association with the recommendation that they be adopted as an American standard. A chart of major welding processes has been practically completed and will be offered shortly for approval.

A specification for iron and steel filler metal has been adopted jointly with the American Society for Testing Materials. Preparation of a specification for alloy steel filler metal also is being considered, as is standardization for coloring ends of various grades of electrodes. Such specifications, however, will be considered for revision from time to time. The adoption of the new building code for New York city by which greater leeway is allowed for welding is expected to have a widespread influence on new building codes in other cities.

A high point of interest was the presentation of the Lincoln Gold Medal to T. M. Jackson, chief electrical and welding engineer, Sun Shipbuilding & Dry Dock Co., Chester, Pa. The medal was awarded Mr. Jackson as author of the best paper on welding, published in the society's journal during the past year, and entitled "Welding in Tanker Construction."

H. Sidney Smith, consulting engineer for Prest-O-Lite Co., was awarded the Samuel Wylie Miller memorial medal for meritorious contributions to the science and art of welding.

Philip George Lang Jr., Baltimore, engineer for bridges, Baltimore & Ohio railroad, was elected president, succeeding Mr. Gibson. Col. G. F. Jenks, ordnance department, United States army, was named senior vice president. Divisional vice presidents are W. J. Sannemann, Tennessee Coal, Iron & Railroad Co., Birmingham, southern division; K. V. King, Standard Oil Co., San Francisco, Pacific coast division.

New directors: E. R. Fish, chief engineer, boiler division, Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.; J. H. Deppeler, chemical engineer and works manager, Metal & Thermit Corp., New York; A. M. Candy, consulting engineer, Hollup company, Chicago; A. E. Gaynor, John A. Roebling's Sons Co., Trenton, N. J., and E. L. Mathy, first vice president, Victor Equipment Co., San Francisco.

New Divisions in Wire Association

AT THE annual meeting of the Wire association in Atlantic City, Oct. 18-21, B. L. McCarthy, chief metallurgist, Wickwire Spencer Steel Co., Buffalo, was the recipient of the Wire association award for the most meritorious contribution to the literature on the wire industry during 1937.

His paper entitled "Abnormal Grain Growth and the Annealing of Low-Carbon Steel Wire" was presented at the Wednesday afternoon session.

Two papers submitted during 1937 were given honorable mention. That of R. W. Sandelin, Atlantic Steel Co., Atlanta ,Ga., was entitled, "A Metallurgical Study of the Factors Affecting the Quality of Galvanizing"; and that of A. B. Dove, Steel Co. of Canada, Hamilton, Ont., "A. C. Electropickling, A Better Method of Pickling."

Registration topped 225. Techni-

B. L. McCarthy
Received Wire association's award for most meritorious contribution to literature of the wire industry in 1937

cal sessions were well attended. At no other annual meeting of the association have papers been so widely discussed. At every session the chairman was obliged to close the discussion and pass to the next paper because of limited time. The association has gained 125 new members since Jan. 1.

Announcement was made of the formation of two new divisions of the association. The first is devoted to nonferrous metals under the direction of E. W. Clark, mechanical engineer, General Electric Co., Schenectady, N. Y. and the second to cold heading and cold working with Mr. McCarthy as chairman. The purpose of both divisions is to promote the art of working ferrous and nonferrous metals.

A.I.M.E. Sessions Well Attended

SEVEN technical sessions and a dinner meeting, extending throughout the week, were held under auspices of the American Institute of Mining and Metallurgical Engineers through its Iron and Steel and Institute of Metals divisions. High spots were the round-table discussion on physics of metals held Monday, with five other technical societies taking part, and a four-star session on open-hearth steel practice on Friday sponsored by the open-hearth committee of the A.I.M.E.

Arthur F. Benton, school of chemistry, University of Virginia, Charlottesville, Va., presented the annual science lecture of the two A.I.M.E. divisions, speaking on the behavior of gases at metal surfaces.

Machine shop practice division of the American Society of Mechanical Engineers joined in the annual dinner of the A.I.M.E. divisions Wednesday evening, at the conclusion of which Harvey N. Davis, president, Stevens Institute of Technology, Hoboken, N. J., outlined his views on the place of the engineer in present-day life.

Steel mill operating men thronged the meeting on open-hearth practice the final day of the convention to hear four experts in this field—P. F. Kinyoun of Bethlehem Steel, W. J. Reagan of Edgewater Steel, Ralph H. Sweetser now with Stuart, James & Cooke; and George L. Danforth Jr., of Open Hearth Combustion Co.

"Investigations on Lead-Magnesium Alloys for the Prevention of Lead Poisoning in Waterfowl" was the intriguing title of a technical dissertation heard Wednesday afternoon, Messrs. R. L. Dowdell and R. G. Green of the University of Minnesota being the authors.

Attendance at all meetings was good. Early estimates on registration for assemblages of the A.I.M.E. divisions ranged up to 400.

Metal Treating Institute Elects Officers

O. T. Muehlemeyer, O. T. Muehlemeyer Co., Rockford, Ill., was elected president of the Metal Treating institute at the annual meeting of the organization at the Ambassador hotel, Atlantic City, N. J., Oct. 18, during the National Metal congress. The institute membership is comprised of companies engaged in commercial heat treating.

C. G. Heilman, Commonwealth Industries, Detroit, was named to the office of vice president; and Roy Lindbergh, A. M. Lindbergh Co., Chicago, was elected secretary-treasurer.

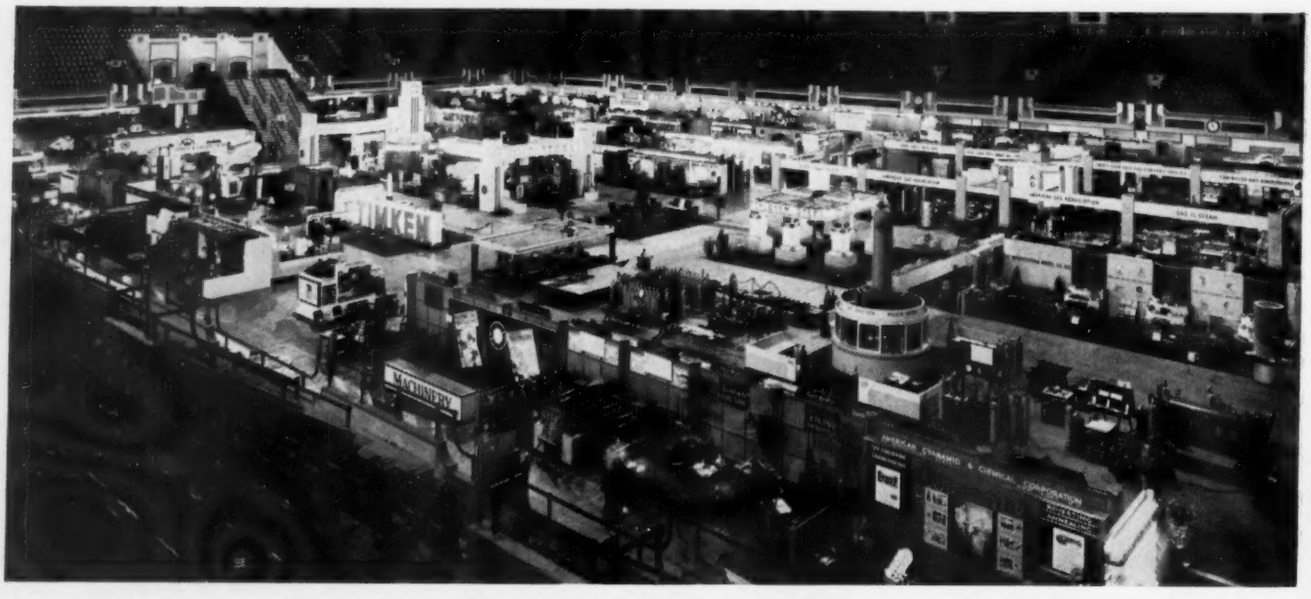
Included in those elected to serve on the board of directors for the coming year were the three officers and the following: A. B. Bach, New England Metallurgical Corp., Boston; Kenneth Stumpf, Stanley P. Rockwell Co., Hartford, Conn.; A. M. Cox, Pittsburgh Commercial Steel Treating Co., Pittsburgh; and Clifford Scott Jr., C. U. Scott & Sons Co., Rock Island, Ill.

Highlights of Metals Exposition

ATLANTIC CITY'S Auditorium last week provided the finest setting the National Metal exposition has ever had. All exhibits were arranged on one floor level with unusually wide aisles. Booth designs were elaborate and colorful, causing many visitors to voice admiration. Evidence was plentiful that the metals industry has enjoyed a satisfactory business year. Highlights of the show as observed by the editors of STEEL are presented in the following paragraphs.

* * *

The five steps which purchasers of sintered carbide tool tips must follow to make their own cutting tools were explained by means of five transparencies displayed by the Firth-Sterling Steel Co., McKees-



Approximately 230 companies displayed their products in the National Metal exposition, which was about 10 per cent larger than the 1936 show. Booth designs were modernistic. Much of the equipment was in operation

port, Pa. Electric flash bulbs in each transparency were synchronized with bulbs in an accompanying key to explain the steps as milling, fitting, cleaning, brazing and grinding.

* * *

Featured prominently in the extensive and artistically-executed exhibit of the Republic Steel Corp., Cleveland, were application of the company's steels in the railroad field. Included was a half cross section of a lightweight, streamline passenger coach built of shot welded stainless steel by the Edward G. Budd Mfg. Co., Philadelphia. Fabricated by spot welding from the company's high tensile, low alloy steel were a section of carline and roof; a sleeping car side section; and a box car side section. A considerable amount of polished stainless steel was used as decorative trim in the booth.

* * *

Maurath Inc., Cleveland, called attention to its product, welding electrodes, by displaying a giant-size bundle representing a package of electrodes in an assortment of compositions and coatings.

* * *

Throughout the metal show, General Electric Co., Schenectady, N. Y., operated a complete electric furnace equipment for scale-free hardening and drawing drill chuck sleeves. The equipment included the hardening furnace, a drawing furnace and degreasing equipment.

* * *

New equipment shown for the first time by Baldwin-Southwark Corp., Philadelphia, included an oscillator testing full-sized structures and determining their natural frequencies, and an electromagnetic fatigue testing machine.

Among special visitors to the exposition on the closing day was a group of 45 German nonferrous metal industry representatives touring the United States for two weeks. The party arrived in New York, Oct. 14 and will sail from there Oct. 26. Cities being visited in addition to New York and Atlantic City are Niagara Falls, N. Y.; Welland, Ont.; Detroit; Chicago; Philadelphia; and Washington.

* * *

The die casting art has progressed to the point where die castings smaller than a grain of rice no longer are a novelty. Among the hundreds of parts on display in the New Jersey Zinc Co.'s booth were zippers, the individual elements of which were cast on a machine with a plunger only one inch in diameter having a stroke of .005 inch. These elements are cast on cloth tape which may be applied to bags, dresses, etc.

(*Please turn to Page* 72)

Europe Feels Check in Steel; Costs Bar Lower Prices

BY VINCENT DELPORT
European Manager, STEEL

"IF the world were calmer business probably would quickly resume its upward trend," says Mr. Delport in his quarterly review of the European steel situation. The volume of orders handled through the international steel cartel has declined. Though British markets are weak "it is unlikely" that prices will be lowered in the near future, because of high costs of production that now prevail. In France in less than a year labor costs have nearly doubled. Yet steel output in the principal countries for eight months has increased over the comparable period in 1936, and Great Britain's output has established an all-time record

LONDON

DURING the summer and early this fall the barometer of European iron and steel trade showed no violent fluctuations, but it did show a definite and gradual trend toward "less fair."

A number of events that have occurred since the early spring have had the effect of putting the brake on the general revival of business then apparent.

Mainly responsible for this retarding influence are hostilities which have developed in the Far East, deterioration of the international situation in connection with the Spanish revolution, further depreciation of the French franc, and, to some extent, the reaction following speculation on rising markets.

Definite indications of the slowing of business are given by reduction in the volume of new orders transacted by the international steel cartel, reduction in the price of Continental pig iron for export, the easier position generally in regard to pig iron and scrap supplies. For example, bookings for September by Cosibel, the Belgian selling organization, totaled 107,000 tons, against 187,000 tons in August and 142,000 tons in June, of which just over 44,000 tons was booked for export in September, compared with 115,000 tons in August and 44,000 tons in June.

The price of Continental foundry pig iron for export, which at the beginning of July was well over £6 10s., has dropped at the time of this writing to £4 12s. 6d. The scrap market is now easier, and it would seem that the tense situation which arose earlier in the summer was due more to anticipation of shortage than to actual requirements at that time.

British Activity Saving Factor

It is fortunate for Continental members of the steel entente that the requirements of the British market continue important, particularly for semifinished steel. The slowing of activities in other markets enables Continental exporters, especially in Belgium, Luxemburg and France, to increase shipments to England.

It is of interest to note that periods of delivery have shortened, and that steel prices are not as firm as during the summer. It is unlikely, however, that a decision will be taken to lower prices in the near future, because of the high costs of production that now prevail and do not tend to decrease. However, for such commodities as pig iron, black sheets and galvanized sheets, the market is weak.

Taking a general view of the situation, a pessimistic feeling prevails due to international complica-

European Production

Gross Tons

	Eight Months 1937	Eight Months 1936	1937 Gain, %
Great Britain	8,385,300	7,590,200	10.5
Germany	12,865,900	12,743,400	1.2
France	5,188,000	4,359,000	19.0
Belgium	2,580,400	2,022,800	28.0
Luxemb'g	1,759,900	1,246,000	41.0

tions and critical conditions in certain countries. There also is the actual fact that business with the Far East is seriously curtailed, and in normal conditions China and Japan constitute important markets, which absorb a substantial proportion of European exports of iron and steel.

If the world were calmer, business probably would quickly resume its upward march.

A rapid review of conditions in the more important steel-producing countries will serve further to illustrate the present position.

Even in England, which still retains first place among the more prosperous countries, there is a feeling of uneasiness, which is reflected mainly on the stock exchange. There has also been a sharp drop in the price of commodities, parallel with the drop in American markets.

On the other hand, far from any reduction in industrial activities, the official returns of insured persons in employment Sept. 13 showed an increase of 473,000, compared with Sept. 21, 1936. Against this there were 1,207,619 totally-unemployed persons.

Early Price Rise Seen

Changes of wages which came into operation in August resulted in an increase of about £98,700 (approximately $500,000) in the weekly full-time wages of 1,307,000 workers, and in a decrease of £40,000 ($200,000) in those of 333,500 workers. Since the early summer, a rise in the cost of many commodities and services has been noticeable.

Steel production has kept to an exceptionally high level since the early part of the year, and an all-time record was attained in September, when the output of steel ingots and castings in Great Britain was 1,163,000 tons. Steel prices in the domestic market are firm, and in view of the increase in railroad freight rates, effective Oct. 1, a further rise in steel prices may occur about the beginning of next year.

Practically all iron and steel works are operating to capacity and are booked to the end of the year, some well into 1938. While supplies of scrap and pig iron have become available lately, there is still a shortage of semi-finished steel, particularly of sheet bars, to such an extent that a number of rerolling plants have to interrupt operations.

The most active industries using steel appear to be the automobile industry, shipbuilding, and constructional work. Figures given by the British Iron and Steel federation show the increase in typical finished products in comparison with 1936 over the first nine months of the year, as follow: Sheets for automobiles, 21 per cent; plates for shipbuilding, 15 per cent; structural steel, 12 per cent. The rearmament program also continues to be responsible for the absorption of a substantial proportion of steel, not only for actual ordnance work, but also for machine tools and other facilities.

Despite the unusually large home consumption of steel in Great Britain, exports are being well maintained. In the first eight months this year iron and steel exports totaled 1,783,112 tons, against 1,430,337 tons and 1,513,792 tons in the corresponding periods of 1936 and 1935 respectively. Imports, at 1,036,346 tons, are about on the same level as for 1936.

France Is Nervous

France has again had a scare in connection with the franc, which has depreciated approximately 35 per cent since June. This was due almost wholly to political uncertainty, of which bear speculators were quick to take advantage. French owners of capital are extremely nervous, and at the slightest threat of further socialist experiments they buy gold or place their money in London or New York. They are loath to invest in their own country, with the result that little can be done in the way of industrial or trade expansion.

There is no doubt the French iron and steel industry has enjoyed greater activity since the beginning of this year than it did in 1936. The production of steel ingots and castings in the first eight months was 5,188,000 metric tons, or 829,000 tons more than in the corresponding period last year. Exports of pig iron during the same period increased from 92,000 tons in 1936 to 260,000 tons this year, but exports of steel products dropped from 1,144,700 tons to 1,079,900 tons.

The output of steel in August, 570,000 tons, was the lowest monthly figure since September, 1936. This is partly ascribed to the effect of new legislation introducing two weeks paid holiday to all workers.

The position is briefly summarized by Societe des Acieries de Longwy, one of the largest iron and steel concerns in France, in its annual report issued Sept. 21.

Labor Costs Nearly Double

It is stated that in less than a year, labor costs have nearly doubled, owing to reduction in hours of work following the 40-hour week, and to increased wages. It is pointed out that, while French steel production has increased since the beginning of the year, it is still only about 90 per cent of the peak reached in 1928, whereas Germany's present rate of output is approximately 104.6 per cent of 1928, Belgium's, 103.7 per cent, and Luxemburg's, 108 per cent.

However, redeeming features are noted at present in the French situation. The fundamental resources of the country remain unimpaired; a considerable advance has been made in working conditions, which will gradually become integrated in the industrial makeup.

In Belgium and Luxemburg production of iron and steel has continued at a high rate, and works are well occupied with orders in hand, probably carrying them to the end of the year. Recently there has been a lull in export trade for the reasons explained at the beginning of this review, but some revival is expected, particularly on the part of South American markets.

Germany's output of steel has exceeded by a small margin the rate of last year, as can be seen by the accompanying table, but it must not be forgotten that German output increased in 1935 and 1936 at a much greater rate than was the case with other countries. Germany enjoys considerable activity in her domestic market, and also a regular share of export trade in the Balkan states, Scandinavia and the Near East. As a result, German steelmakers took only a small portion of the trade with Great Britain.

Other European steel-producing countries are generally enjoying more active conditions this year than in 1936, and a substantial increase for 1937 is a certainty.

U. S. Produces Larger Share of World's Steel

UNITED STATES produced a larg- share of the world's steel output in the first half of 1937 than in the year 1936, according to the American Iron and Steel institute. American output for the first six months this year was 41.9 per cent of the world total, compared with 39 per cent in 1936.

World output totaled approximately 69,800,000 gross tons of steel ingots and castings in the first half of 1937. About 29,265,000 tons were made in this country. World production in 1936 amounted to 122,000,000 gross tons, of which 47,768,000 were made in the United States.

World production in the first half was more than 21 per cent above the output of 57,600,000 gross tons in the corresponding 1936 period. Of the 13 major steelmaking countries, producing about 97 per cent of the world total, only Italy produced less in the first half this year than in the similar 1936 period.

Second largest steelmaking country is Germany. Russia in third place is approaching Germany's output. Great Britain, France and Belgium rank behind Russia.

Freight Advance Expected To Stimulate Steel Buying

AN INCREASE in steel buying is expected to result from the decision by the interstate commerce commission approving higher freight rates on basic commodities, almost to the entire extent requested by the carriers.

It is estimated that the raise will provide approximately $47,500,000 additional revenue on the basis of the 1936 volume of traffic.

The fall buying programs of the railroads have been held in abeyance pending the outcome of their petition. With the added revenue now assured it is believed they will proceed to formulate their plans, requirements for new equipment and steel for car repairs bulking large in the market.

It was reliably reported last week after the commission's decision became known that the railroads will prepare shortly another petition asking for an additional 15 per cent increase. The railroad wage increase recently authorized, it was pointed out, amounts to $135,000,000 a year.

Increase About 10 Per Cent

The new rates, up approximately 10 per cent, will go in effect as soon as the carriers are able to prepare and publish the tariffs. Except where steel consumers are already heavily stocked, it is believed buying from this source will be stimulated, to take advantage of the present rates.

Rates on iron and steel and related articles, except scrap iron and steel in the western district, are advanced 10 per cent, with a maximum of 1 cent per 100 pounds. Scrap iron and steel in the western district and between that district and others, is raised 20 per cent, with a maximum of 2 cents per 100 pounds; iron ore 5 cents per net ton, or 6 cents per gross ton. However, no advance is allowed on ore from Minnesota mines to Lake Superior docks.

The commission in its decision stated:

"In general the applicants propose to increase rates on manufactured iron and steel 10 per cent, but not in excess of 1 cent per 100 pounds, or 20 cents per ton net or gross, as rated. Some similar increases are proposed on articles in the pig iron group.

"Proposed billet rates represent an increase of 10 per cent, but not in excess of 20 cents per ton, and subject to further limitations that the rate would not exceed 30 per cent of first class in official territory, applied on 2240 pounds the same as on 2000 pounds.

"On scrap iron and steel within the western territory and to and from that territory, commodity rates would be increased 20 per cent, limited to a maximum of 40 cents per ton net or gross."

The commission's decision was based on the foregoing conditions.

In connection with billets and iron and steel scrap, the commission states that within the western trunk line and southwestern territories and between those territories and other territories the general basis of scrap iron rates is 15 per cent of the first class minimum 50,000 pounds, alternating with rates 12.5 per cent of first class minimum 75,000 pounds.

It was proposed to increase these rates 20 per cent, subject to a minimum of 40 cents per ton net or gross. The same percentage of increase was proposed for scrap iron rates in Illinois. This was allowed by the commission.

Increases on bituminous coal were granted for a period to terminate Dec. 31, 1938.

Additional news of the steel and metalworking industries will be found on pages 99 and 100.

Production

STEELWORKS operations last week dropped 10 points to 53 per cent. Chicago and Pittsburgh each receded 11 points and other centers lost from 3 to 10 points. Indications are that this week will see further shrinkage. This rate is the lowest since the first week of February, 1936, when 50 per cent was touched.

Pittsburgh — Down 11 points to 49 per cent, lowest for any full week since March, 1936. Blast furnace activity also has declined, 35 stacks being active in the district at this writing, compared to 48 one month ago.

Wheeling — Down 4 points to 70 per cent, lowest for a regular weekly period since July, 1936.

New England — Scheduled improvement in ingot production last week failed to materialize and loss of 5 points brought the rate down to 65 per cent. Removal of numerous units this week will bring the lowest rate in several years, not much above 20 per cent.

Buffalo — Down 9.5 points to 58 per cent, the lowest rate for the past 18 months. Four open hearths were taken off last week. The leading interest here now has 19 open hearths in production, compared with 29 at the peak.

Youngstown, O. — Down 3 points to 55 per cent, with 49 of 83 open hearths, two out of three bessemer converters and 17 out of 25 blast furnaces active. A slight upturn is expected this week from added bessemer production.

Cincinnati — Down 4 points to 66 per cent of capacity, with 16 open hearths active. The same schedule for the present week.

Cleveland — Down 3 points to 65 per cent, one open hearth being taken out of commission.

Detroit — Up 3 points to 95 per cent, with 20 of 21 open hearths melting for full week.

Central eastern seaboard — Off 4 points to 47 per cent on more restricted activity at one or two points. Most independents are maintaining production but one expects to go down this week.

Chicago — Down 11 points to 46 per cent, a loss of nearly 30 points in three weeks and the lowest since July, 1935. Further reduction is in prospect for this week. Active blast furnaces number 23 out of 39.

Birmingham, Ala.—Down 6 points to 64 per cent of capacity, with 15 open hearths in service.

St. Louis — Down 8.4 points to 51.6 per cent, as result of shutting down two open hearths.

District Steel Rate

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Oct. 23	Change	Same week 1936	Same week 1935
Pittsburgh ..	49	—11	70	47
Chicago	46	—11	74.5	54
Eastern Pa...	47	—4	48	38
Youngstown..	55	—3	77	62
Wheeling	70	—4	92	78
Cleveland ...	65	—3	79.5	64
Buffalo	58	—9.5	84	40
Birmingham..	64	—6	61.5	58.5
New England	65	—5	75	68
Cincinnati ...	66	—4	96	†
Detroit	95	+3	100	88
St. Louis	51.6	—8.4	†	†
Average....	53	—10	73	52½

†Not reported.

Financial

SHEET & TUBE PROFITS UP; NEW CAPITAL AUTHORIZED

NET earnings of the Youngstown Sheet & Tube Co. for the third quarter amounted to $3,586,495, compared to $2,022,112 for the second quarter this year and $2,359,998 for the third quarter of 1936, Henry G. Dalton, chairman, announced at a meeting of common shareholders in Youngstown.

Net earnings for the first nine months this year were $10,494,627, compared to $6,845,386 for the first nine months of 1936. These figures are without deduction for federal surtax on undistributed profits.

Shareholders approved an increase in the authorized common shares from 2,000,000 to 2,500,000, release of pre-emptive rights of common shareholders on not exceeding 400,000 common shares, and authorized the board of directors to issue securities convertible into common shares.

Such action was taken to place the company in a position to undertake new financing when and as the board may consider advisable. No definite plans have been made, but it is expected the amount would be approximately $30,000,000. Any new securities issued would be offered first to common shareholders pro rata.

Purposes would be to provide funds for new equipment and plant improvements at Youngstown and Chicago; to add to working capital, and pay off bank loans amounting to $5,000,000.

Mr. Dalton pointed out that $11,500,000 of the $35,000,000 spent by the company for improvements since Jan. 1, 1934, had been taken from working capital. The amount required for inventories and receivables has substantially increased, indicating the desirability of adding to working capital.

DIVIDENDS DECLARED

Directors of Eaton Mfg. Co., Cleveland, have declared a dividend of 75 cents per common share, payable Nov. 15 to stockholders of record Nov. 1, bringing total dividends on the common this year to $2.50 per share. Earnings for the nine months ending Sept. 30 were $2,141,951, equal to $3.07 per share on 696,146 common shares outstanding.

Minneapolis-Moline Power Implement Co., Minneapolis, has declared a dividend of $6.50 a share on convertible $6.50 preferred stock, payable Oct. 26 to record Oct. 23. On Dec. 24 last the company paid $3 dividend on the preferred.

Clark Equipment Co., Buchanan, Mich., has declared a special dividend of $3 per share on the common stock, payable in $100 par 7 per cent cumulative preferred stock on Dec. 1 to record Oct. 30.

Ludlum Steel Co., Watervliet, N. Y., declared a dividend of 25 cents per share on common, payable Nov. 15 to record Oct. 30. Like amount was paid Aug. 16.

Continental Can Co. Inc., New York, declared a regular quarterly dividend of 75 cents a share on common stock, payable Nov. 15 to holders of record Oct. 25.

PITTSBURGH COKE & IRON PLANS STOCK DIVIDEND

Pittsburgh Coke & Iron Co., Pittsburgh, has called a meeting of preferred stockholders Nov. 18 to vote on the issue of not exceeding 7500 shares of similar preferred stock as a stock dividend upon the common stock of the company.

J. H. Hillman Jr., president, in a letter to preferred stockholders, said that "on the basis of present estimates of earnings for the full year, the company will become obligated to pay a surtax of approximately $150,000 to $175,000 on its undistributed net income unless some dividend is paid during the year on the common stock. . . . It is the present view of the management that a dividend of from 6000 to 7000 shares of preferred stock should be paid on the common stock this year."

RUSTLESS IRON EARNINGS

Rustless Iron & Steel Corp., Baltimore, had a net profit of $199,919 for the third quarter, compared with $203,908 in the June quarter. Net income for the nine months ending Sept. 30 was $574,841 against $228,272 in the period a year ago. These figures correct typographical errors which appeared on page 21, Oct. 18 issue.

OTIS STEEL EARNINGS NEARLY DOUBLE 1936

Otis Steel Co., Cleveland, has declared a dividend of $1.375 per share on the company's convertible first preferred stock for the quarter ending Dec. 15, payable on that date to stockholders of record Dec. 1.

A dividend of $43.75 per share on the prior preference stock payable Nov. 15, to the holders of record Nov. 5, was also declared, satisfying all dividends accrued on this stock.

Directors also authorized redemption of the prior preference stock at $111.75 a share.

E. J. Kulas, president, also announced earnings for the three months ending Sept. 30, were $948,285.41 after all charges and provision for estimated federal normal income tax. This compares with $495,109.92 for the same period of 1936. Earnings for the nine months ending Sept. 30, were $2,691,105.80, compared with $1,395,459.60 for the same period of 1936.

MIDLAND PROFITS HIGHER

Earnings statement of the Midland Steel Products Co., with no provision for federal taxes on undistributed profits, indicates that after deducting dividend requirements of $6 per share on the 8 per cent cumulative first preferred, and $1.50 per share on the $2 non-cumulative dividend shares in the hands of the public, $907,639.78 remains for the common stocks, equal to $3.863 per share for the first nine months of 1937. Earnings were $2.738 per share in the same period of 1936.

Earnings of Consumers, Suppliers and Producers

All figures are profits except where asterisk denotes a deficit.

	Third Quarter		Nine Months	
	1937	1936	1937	1936
Edward G. Budd Mfg. Co., Philadelphia	$107,564	*$547,401	$1,198,330	$774,404
Budd Wheel Co., Philadelphia	75,055	140,035	596,015	658,738
Nat. Mal. & Steel Castings Co., Cleveland	435,117	396,818	2,329,789	1,054,211
Mullins Mfg. Corp., New York	170,086	136,276	575,188	409,304
Ciark Equipment Co., Buchanan, Mich.	251,368	110,663	1,039,807	353,531
Bridgeport Machine Co., Wichita, Kans.	205,790	116,567	586,492	349,581
A. M. Castle & Co., Chicago	242,547	162,207	887,334	396,426
Truscon Steel Co., Youngstown, O.	231,905	312,041	456,863	632,257
Bliss & Laughlin Inc., Harvey, Ill.	.....	.....	648,203	449,817
Monarch Machine Tool Co., Sidney, O.	150,272	.....	334,173	.....
New York Air Brake Co., New York	.....	.....	1,007,051	577,183
General Electric Co., Schenectady, N. Y.	13,370,327	9,941,343	39,663,931	26,533,667
Westinghouse Air Brake Co., Wilmerding, Pa.	1,846,833	1,153,091	5,838,134	2,503,764
General Refractories Co., Philadelphia	449,228	508,941	1,516,501	1,052,308
Pittsburgh Coke & Iron Co., Pittsburgh	277,968	277,968	801,335	.....
Eaton Mfg. Co., Cleveland	432,322	501,431	2,141,952	1,836,716
Marion Steam Shovel Co., Marion, O.	236,466	78,667	297,251	110,155
Remington Rand Inc., Buffalo	912,401	268,729	.....	.....
Easy Washing Machine Co., Syracuse, N. Y.	108,994	.....	405,197	.....
Caterpillar Tractor Co., Peoria, Ill.	2,833,061	2,551,379	9,135,936	7,032,470
American Radiator Co., New York	.....	.....	6,537,000	4,544,000
American Brake Shoe & Fdry. Co., New York	829,649	604,162	2,752,320	1,675,150
Otis Steel Co., Cleveland	948,285	495,110	2,691,105	1,395,459
Pittsburgh Screw & Bolt Corp., Pittsburgh	.....	.....	1,270,173	712,008
Keystone Steel & Wire Co., Peoria, Ill.	203,693	225,705	.....	.....
Sharon Steel Corp.	498,570	342,418	1,646,606	823,370
Continental Steel Corp.	258,890	71,843	793,512	397,461
Rustless Iron & Steel Corp.	199,919	90,250	574,841	228,272
Interlake Iron Corp.	837,371	99,311	1,782,408	67,634
Acme Steel Co.	305,863	538,847	2,070,245	1,444,474
Cleveland-Cliffs Iron Co., Cleveland	2,231,803	1,437,757	4,104,171	2,022,196
M. A. Hanna Co., Cleveland	972,217	614,418	2,362,651	1,518,845
Youngstown Sheet & Tube Co.	3,586,495	2,359,998	10,494,627	6,845,386

Sales, Machine Tool Theme

SALES promotion, training of salesmen and overhead expense of the distributor were discussed at the annual meeting of Associated Machine Tool Dealers at French Lick, Ind., Oct. 11 and 12. The aim of the organization is promotion of better merchandising methods and closer co-operation with manufacturers.

F. B. Scott Jr., Syracuse Supply Co., Syracuse, N. Y., speaking on salesman training, described in detail the methods used by his company in acquainting salesmen with the products they sell. He also laid much stress on the importance of reports on all calls, indicating the types of machines involved in the calls. From tabulations based on these reports data are obtained to encourage salesmen and form a basis for contacting machine builders.

Importance of adequate statistics and the use of advertising in increasing machine tool sales were emphasized by Harry S. Robinson, secretary and sales manager of the Cincinnati Shaper Co., Cincinnati.

Business Conditions Discussed

Problems of overhead expense of the machine tool distributor were discussed by H. R. Rinehart, secretary-treasurer of National Supply and Machinery Distributors' association. Reports of various committees evoked lively discussion of current business conditions and common problems of members. A report on activities of the organization was presented by Thomas A. Fernley Jr., executive secretary.

Talks were made at the dinner meeting, Monday evening, by Homer Bayliss of the Detroit office of the Motch & Merryweather Machinery Co., Cleveland, and Charles A. Odegaard, Federal Machinery Sales Co., Chicago. They commented on results of meetings recently held in Detroit and Chicago, attended by direct sellers and dealers, resulting in better understanding of common problems. Other addresses were made by Tell Berna, general manager of National Machine Tool Builders' association, Cleveland; Henry C. Pierle, secretary and sales manager of R. K. LeBlond Machine Tool Co., Cincinnati, and Jack C. Carlton, president of Carlton Machine Tool Co., Cincinnati.

A. G. Bryant, Bryant Machinery & Engineering Co., Chicago, was elected president; John Sauer Jr., Peninsular Machinery Co., Detroit, vice president, and E. P. Essley, E. L. Essley Machinery Co., Chicago, secretary-treasurer.

H. E. Oatis, National Supply Co., Toledo, O.; F. W. Schiefer, F. W. Schiefer Machinery Co., Rochester, N. Y., and F. Rodger Lindsay, Swind Machinery Co., Philadelphia, were elected members of the executive committee for terms expiring in 1940. Harry Barney, Barney Machinery Co., Pittsburgh, retiring president, will serve on the executive committee for the coming year.

Founders Oppose Wages-Hours Bills

NECESSITY for figuring costs on every job was emphasized at the fall meeting of the Steel Founders Society of America, Hot Springs, Va., Oct. 15-19, in the presidential address of F. A. Lorenz Jr., American Steel Foundries, Chicago. More than 100 steel foundrymen attended the meeting.

Opposition to pending federal wages-hours legislation was recorded in a resolution unanimously adopted. "Whereas we are in accord with the professed objectives of the legislation . . . . these matters are of such a complex economic nature that they cannot be dealt with properly or effectively by governmental edict or regulation . . . . this type of legislation is not in the interests of the industry, the wage earner, the consuming public or the nation as a whole."

James A. Emery, general counsel, National Association of Manufacturers, addressed the meeting on "Federal Control of Employment Relations." Tracing such control attempts through the NRA, the Wagner act, the Walsh-Healey act and the proposed wages-hours bill, he asserted public interest is adversely affected by such legislation.

Members agreed to set aside a sizable appropriation in next year's budget for business paper advertising and also that funds be made available for product and process research work.

The cost and accounting committee is now at work on a revised and up-to-date method for determining job costs. An industry-wide survey is being conducted to determine what practices now are being followed. After analyzing present methods the committee will undertake to develop as simple as possible a method of determining cost of producing castings from any given pattern.

The society's annual meeting was scheduled for Cleveland, Feb. 9, and probably will continue two days.

Equipment Orders 72% Over 1936

FOUNDRY Equipment Manufacturers' association met in White Sulphur Springs, W. Va., Oct. 18 and 19, with about 75 per cent of the sales volume of the membership represented.

Discussion at the first session centered around pending wage and hour legislation, the importance of increasing the supply of skilled labor, and increasing expenses which must be met by industry. Herbert S. Simpson, president, National Engineering Co., Chicago, pointed out the excessive taxes assessed against companies in Illinois by federal, state and local taxing units.

A general survey of business conditions by those present indicated that the average business for the group during the first 9 months of 1937 was approximately 72 per cent ahead of the sales during the similar period in 1936. Further reports indicated foundry business rather spotty, with a divergence of opinion among castings manufacturers as to the probable demand for cast products during the next few months. Several branches of the industry, including agricultural implements and automotive are busy.

Outlines Advertising Methods

Reports were made by various committee chairmen. A paper "What About Advertising" was presented at the final session by J. M. Lathrop, advertising manager of *The Foundry*, Cleveland. Mr. Lathrop outlined the various forms of advertising which may be employed by the equipment manufacturer, and stressed their valuable features.

Motion pictures taken by W. F. Piper, Beardsley & Piper Co., Chicago, on his recent trip around the world were shown Tuesday.

The members discussed the value of more frequent meetings and voted to meet in the future in the spring and fall, as well as in February for the annual meeting. R. S. Hammond, Whiting Corp., Chicago, is president of the association. H. S. Hersey, C. O. Bartlett & Snow Co., Cleveland, is vice president, and Arthur J. Tuscany, Tuscany, Turner and Associates, Cleveland, is executive secretary.

That industry has succeeded in making conditions of work more conducive to health and happiness than are surroundings of workers at home or during recreation, was stated by B. C. Heacock, president of Illinois Manufacturers' association, in a recent address before that organization.

Hopeful Sentiment for 1938 At Hardware Conventions

MODERATE optimism concerning business was evident at the large gathering of representatives of the hardware industry in Chicago last week. The occasion was the forty-third annual convention of the National Wholesale Hardware association and its auxiliaries, the National Association of Sheet Metal Distributors and the Accessories branch, and the seventy-fifty semiannual convention of the American Hardware Manufacturers association. With a total registration of 1400, total attendance was estimated at nearly 2000.

Expectations of an average business year in 1938 were expressed at the opening session of the National Wholesale Hardware association in the presidential address of Shannon Crandall, California Hardware Co., Los Angeles.

Basic Condition Excellent

"There probably will be recession in price values but not of a violent character," he stated. "While we should extend conservatism in our purchases and caution in our extension of credit, yet taking all things into consideration we must maintain reasonable stocks to perform properly our function. Also, while our profit account will in all probability show a decline over the present year, yet let us bear in mind that basically the country is in excellent condition; and if our future actions are wisely and carefully pursued, I look for 1938 to be a reasonably satisfactory and prosperous year.

"The lull that we have recently experienced in many sections of the country is, in my opinion, just the perfectly natural reaction from the near-boom conditions of eight or ten months ago. In many ways it would have been most unfortunate if the conditions which existed in January and February had continued. Prices were being advanced entirely too rapidly and the urge for increased production in the factories was no doubt a contributing cause to labor unrest."

Current pessimism in business is not altogether warranted, it was stated by Robert G. Thompson, the Lufkin Rule Co., Saginaw, Mich., president of the American Hardware Manufacturers association. He indicated, however, quiet business is to be expected during the balance of the year and that developments at Washington are likely to have some influence on the business trend. He recommended revisions in the federal tax policy.

Reports of various committees of the National Association of Sheet Metal Distributors were given at a meeting presided over by its president, A. W. Howe, the J. M. & L. A. Osborn Co., Cleveland. A report of the galvanized and black sheet and corrugated roofing committee, presented by A. J. Becker, Ohio Valley Hardware & Roofing Co., Evansville, Ind., provoked considerable discussion relative to the proposed elimination of the functional differential allowed jobbers on flat and formed galvanized sheets by producers.

A resolution was passed recommending this allowance by the mills be continued on all purchases by jobbers whether for direct shipment or for stock.

A standard on roofing ternes was announced in the report of the tin and terne plate committee, presented by O. F. Murphy, Lyon, Conklin & Co. Inc., Baltimore. Roofing terne sales gained 23 per cent this year.

Discussing distribution of terne plate, George E. Totten, Carnegie-Illinois Steel Corp., Pittsburgh, suggested use of this product be identified with quality construction and that architects, home owners and builders be acquainted with its advantages.

A recommendation jobbers and producers confine galvanized sheet sales activities to their recognized fields was made in a paper by F. R. Meyer Jr., Inland Steel Co., Chicago. He urged jobbers restrict their market to orders of less than carload from stock and that producers seek no less than carload business.

Pointing out that of the 1,500,000 tons of galvanized sheets sold in 1936, jobbers and distributors accounted for about 524,000 tons of this business, Mr. Meyer indicated this product can be made to return a good profit to the distributor.

Various talks on economic subjects were presented. Of tariff problems, Prof. Walter R. Peabody, Rutgers university, said it is not logical to lower duties of the United States in the face of steady advances in wages and other costs and that stabilization of foreign exchange should precede revisions. A change in the use of restrictive devices by foreign countries in regulating their imports also should occur before general curtailment is made in domestic tariffs.

Calls for Balanced Budget

Henry H. Heimann, executive manager, National Association of Credit Men, pointed out various factors he considers necessary to establish solid prosperity. Indicating a balanced budget is highly important, he declared the size of the public debt is not so alarming as are the trend and the distribution. His recommendations include a balanced budget and a limit on the amount of money congress is permitted to appropriate.

Discussing the business outlook, Mr. Heimann expressed belief no sustained depression is in sight so long as easy credit and good income in the farm and labor groups continue, although it is likely business will continue slow until the middle of 1938.

A bill to restrict the activities of branch retail outlets probably will be introduced at a coming session of congress, it was indicated in an address by Wright Patman, Texas congressman. He announced he has prepared a bill to prohibit any corporation from owning retail outlets in any state except the one in which it is incorporated.

Mr. Patman pointed out such a measure would affect mail order houses and asserted the government lost money in acting as a delivery boy and advertising agency for them. He declared the subsidy should be stopped and discrimination against local business removed.

He predicted no efforts to change the Robinson-Patman act would be made and said this measure is meeting with approval of business.

Dr. Harold G. Moulton, president, Brookings institution, declared the country's need today is greater production. He placed the recent volume of national production at 85 per cent of that of 1929.

Hardware Associations Elect Officers

AMERICAN Hardware Manufacturers association elected the following officers: President, Robert G. Thompson, Lufkin Rule Co., Saginaw, Mich.; vice presidents, H. B. Wilson, Mathias Klein & Sons, Chicago; Houston Dudley, Gray & Dudley Co., Nashville, Tenn.; Richard Harte, Ames Baldwin Wyoming Co., Parkersburg, W. Va.

The National Wholesale Hardware association elected: President, Shannon Crandall, California Hardware Co., Los Angeles; vice presidents, Mark Lyons, McGowin-Lyons Hardware & Supply Co., Mobile, Ala.; Glenn E. Jennings, Wright & Wilhelmy Co., Omaha, Nebr.; A. W. Hoe, The J. M. & L. A. Osborn Co., Cleveland.

Meetings

FOREIGN TRADE CONVENTION TO BE HELD IN CLEVELAND

MAJOR problems of foreign trade will be discussed at the twenty-fourth national foreign trade convention in Cleveland Nov. 3-5, sponsored by the National Foreign Trade council of which James A. Farrell, former president, United States Steel Corp., is chairman. Approximately 1000 delegates are expected.

A world trade dinner will be held at the Hotel Statler Nov. 4, at which a message from Cordell Hull, secretary of state, will be read. All other sessions will be held at the Hotel Cleveland, convention headquarters.

OPEN HEARTH GROUP PLANS MEETING IN PORTSMOUTH

Third meeting of the Cincinnati section of the Open Hearth committee, American Institute of Mining and Metallurgical Engineers, is to be held at the Washington hotel, Portsmouth, O., Oct. 27.

The program will be of the round-table type. A long list of subjects under the headings of practice, refractories, pit practice, quality and combustion, has been circulated widely. The meeting will close with a trip through Wheeling Steel Corp.'s Portsmouth, O., plant and a dinner.

FUEL ENGINEERS WILL DISCUSS COAL PROBLEMS

Fuel engineers and coal technologists of Appalachian Coals Inc., Cincinnati, will discuss problems concerning industrial coal application and utilization with executives and power plant engineers of coal-consuming industries at a meeting in the Columbia hotel, Kalamazoo, Mich., Nov. 3. A similar symposium held in Detroit last June attracted 200 representatives of coal-consuming industries of Michigan and northwestern Ohio.

PHILADELPHIA WELDERS ARRANGE 1937-38 PROGRAM

Philadelphia section of the American Welding Society, with headquarters at the Engineers club, 1317 Spruce street, has announced the following 1937-38 program: Nov. 15, "New Developments In Welding-Flame Hardening-Multi-Pass Welding," Dr. G. V. Slottman, Air Reduction Sales Co., New York; Jan. 17, "Electric Welding Progress," J. F. Lincoln, Lincoln Electric Co., Cleveland; Feb. 21, "Fabrication and Uses of High Yield Strength Alloys," with a speaker, associated with the United States Steel Corp., to be announced later.

March 21, "The Uses of Castings in Heavy Welding Assemblies," Mr. Jessup, S. Morgan Smith Co., York, Pa.; April 18, "Welding and Modern Building Construction," E. L. Durkee, Bethlehem Steel Co., Bethlehem, Pa.; and May, the exact date yet to be announced, an inspection trip through a plant where welding is an important activity. The papers will be presented at meetings at the Engineers club.

Radio Range Towers To Take 2000 Tons of Steel

Contracts for the erection of 44 new five-tower radio-range stations and improvement of a number of existing stations have been awarded by the department of commerce. Blaw-Knox Co., Pittsburgh, will fabricate 400 towers to be used in the new stations and to modernize and relocate present stations. Towers will require five tons of steel each, a total of 2000 tons.

Westinghouse Electric & Mfg. Co. has been awarded a $700,000 contract for building the 44 new range stations. These will be of the improved simultaneous type which permits continuous transmission of "on course" signals to airplane pilots without interruption for weather broadcasts. Starting in March, 1938, these will be installed at a rate of six a month.

Range stations, usually located near an airport, transmit beamed signals in a quadrant, between predetermined points and provide pilots with a dependable and constant guide to their destination.

Convention Calendar

Oct. 24-29—National Electrical Manufacturers association. Annual convention at Palmer House, Chicago. W. J. Donald, 155 East Forty-fourth street, New York, is managing director.

Oct. 26-29—American Institute of Steel Construction. Fifteenth annual meeting at Greenbrier hotel, White Sulphur Springs, W. Va. V. Gilmore Iden, 200 Madison avenue, New York, is secretary.

Oct. 27-29—American Society of Mechanical Engineers and American Institute of Mining and Metallurgical Engineers. Joint coal meeting in Pittsburgh. Headquarters of the two societies are at 29 West Thirty-ninth street, New York.

Oct. 29-30 — American Foundrymen's association. Second annual foundry conference with Quad City chapter at State University of Iowa, Iowa City, Iowa. D. M. Avey, 222 West Adams street, Chicago, is secretary.

Nov. 3-5—National Foreign Trade council. Twenty-fourth national foreign trade convention at Hotel Cleveland, Cleveland. Lindsay Crawford, 26 Beaver street, New York, is secretary.

Activities of Steel Users and Makers

REPUBLIC STEEL CORP., Cleveland, has appointed Howard Supply Co., Los Angeles, a newly organized supply house, as distributors of its oil country tubular products on the West coast. The new company is headed by Harold E. Howard as president, L. George Trembley, vice president and sales manager, and Arthur Moyer, secretary-treasurer. Messrs. Howard, Trembley and Moyer were formerly associated with Ducommun Metals & Supply Co.

♦ ♦ ♦

Manufacturing facilities are being expanded for increased production of the new line of spring making machines which the Torrington Mfg. Co., Torrington, Conn., announced in August this year. The company reports sales quota for the first six months has already been achieved.

♦ ♦ ♦

Clark Controller Co., Cleveland, has removed its Detroit office to 710 Fisher building. Coincident with this move to larger space, Arthur B. Sonneborn, manager of the Detroit office, with John Kilpatrick and George B. Martin, will also represent Federal Welder interests.

♦ ♦ ♦

Detroit Rex Products Co., Detroit, manufacturer of Detrex degreasing machines, solvents and alkali cleaners and strippers, has opened a branch office in the Provident Bank building, Cincinnati. This office will serve the lower Ohio and Indiana areas as well as the northern section of Kentucky.

♦ ♦ ♦

Maremont Automotive Products Inc., Chicago, maker of automobile springs, prompted by increasing use of its warehouse facilities by jobbers and spring service stations in the metropolitan area of New York, has changed its warehouse headquarters in Brooklyn to its own exclusively operated branch at 1651 Bedford avenue. Bill Wolff, representative, who handles sales for the greater New York area, is in charge of the warehouse.

♦ ♦ ♦

Work on the building at Sharon, Pa., for Westinghouse Electric & Mfg. Co. is being expedited. Requiring 270 tons of steel, it will be completely welded. The structure, 60 x 150 feet, is three stories high in addition to the basement, in which a large auditorium will be located. Two floors will be used for drafting and engineering, and one will be for sales and private offices. The entire building will be air conditioned, using the central plant and duct system for cooling, heating, cleaning and humidifying.

Men of Industry

GEORGE W. Walker is now acting as industrial stylist in a consulting capacity for Nash-Kelvinator Corp., Detroit. In addition to designing the 1938 line of Nash cars, he will have charge of styling of Kelvinator refrigerators and applied products of the company. At present he is in Europe attending the London and Paris automobile shows.

A. Don Mortrude, formerly associated with the art and color division of General Motors Corp. and the styling division of Chrysler Corp.; J. Herbert Newport, at one time body stylist for Broun Body Co. and designer for Duesenberg; and Wayne R. Porter, formerly associated with the designing department of the fabricated steel division of Whitehead & Kales Inc., Detroit, have been appointed to assist Mr. Walker at his headquarters in the New Center building, Detroit.

♦ ♦ ♦

F. M. Maichle, heretofore manager at Pittsburgh for Lincoln Electric Co., Cleveland, has been named manager of arc welding sales at Detroit.

♦ ♦ ♦

Ben White Jr., formerly with Erie Concrete & Steel Supply Co., has recently joined the Erie Steel Construction Co., Erie, Pa., as sales engineer.

♦ ♦ ♦

John P. Courtright, district manager at Chicago for Marion Steam Shovel Co., Marion, O., has been transferred to the general sales office at Marion, as sales manager.

♦ ♦ ♦

Robert A. Campbell, formerly associated with Steel & Tubes Inc., and until recently assistant sales manager, welded tube division of Standard Tube Co., has resigned to join the Ohio Seamless Tube Co. as assistant manager of sales in charge of electric welded tubing. He will be located at the main office of the company in Shelby, O.

Robert A. Campbell

George W. Walker

♦ ♦ ♦

Robert Sinclair, for three years manager of the Buenos Aires office of the Allis-Chalmers Mfg. Co., Milwaukee, has returned to the home office staff. He is succeeded in the Argentine by James A. Conlan.

♦ ♦ ♦

Robert Bischoff, hydraulic engineer, has been placed in charge of all valve engineering for the Western Gas division of Koppers Co., Fort Wayne, Ind. He formerly was associated with the manufacture of hydraulic turbines in Switzerland.

♦ ♦ ♦

LeRoy Holt, director of sales promotion, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., has been given the added duties of supervisor, farm products department. He will have the assistance of Luther Fuller, formerly Alabama representative for that department.

♦ ♦ ♦

Howard J. Kaighin has been elected president and treasurer, American Welding & Mfg. Co., Warren, O. He succeeds J. C. Manternach, who will continue with the company for an indefinite period in an advisory or consulting capacity.

♦ ♦ ♦

Alexander W. Limont Jr., associated with E. I. dupont de Nemours & Co. the past nine years, has become manager of the compressor division of Sullivan Machinery Co., Michigan City, Ind. He is a member of the American Society of Mechanical Engineers committee which establishes the codes for unfired pressure and external pressure vessels.

♦ ♦ ♦

A. D. Heffron Jr. has been appointed western sales manager of the Standard Tube Co., Detroit, maker of seamless welded and butted steel tubing, with headquarters in the company's Chicago office. Mr. Heffron was formerly associated with Globe Steel Tubes Co., and more recently was Chicago district sales manager for the Babcock & Wilcox Tube Co.

♦ ♦ ♦

H. L. Brindle, who was placed in charge of the Edgar Thomson works, Carnegie-Illinois Steel Corp., Braddock, Pa., recently when Frank F. Slick was granted an indefinite leave of absence, has been given the title of general superintendent. He went to Edgar Thomson from Youngstown on Sept. 1 as acting general superintendent.

♦ ♦ ♦

Charles R. Emerson, Virginia, Minn., mine superintendent for Wheeling Steel Corp., Wheeling, W. Va., has been appointed general superintendent of iron mines for the company. He succeeds Frank Bergstrom, resigned. Edwin C. Johnson, office manager, becomes assistant general superintendent.

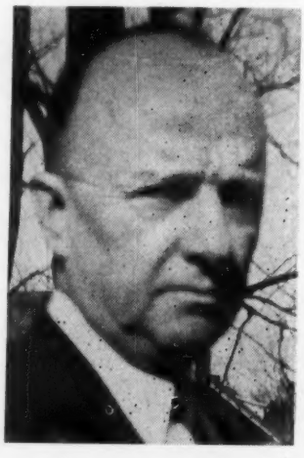
♦ ♦ ♦

William W. Cochrane has been appointed distributor of Tri-Lock open steel flooring and American tubular hoisting towers and accessories in the state of Wisconsin. He will maintain offices at 317 Underwriters Exchange building, Milwaukee. These products are distributed nationally by the machinery division of Dravo Corp., Pittsburgh.

Mr. Cochrane will also represent Fitzsimons Co., Youngstown, O., producer of cold drawn steel.

♦ ♦ ♦

Charles H. Bradley has become associated with the Wellman Engineering Co., Cleveland, as sales engineer. Mr. Bradley has held important engineering positions with firms devoted to designing and manufacturing steel plant equipment, as well as with several well known steel plants. Early in his career, he was employed by Heyl & Patterson, Pittsburgh; National Tube Co., McKeesport,



Charles H. Bradley

Pa., Tennessee Coal, Iron & Railroad Co., Perin & Marshall, engineers, and Otis Steel Co. He was chief engineer, Variety Iron Works, and for sometime had general charge of the industrial division, American Shipbuilding Co. More recently, he had been in the employ of the engineering department, Republic Steel Corp., which position he left to join Wellman.

♦ ♦ ♦

R. R. LaPelle has joined the staff of Gas Machinery Co. Inc., Cleveland, as a furnace engineer. He formerly was associated with Westinghouse Electric & Mfg. Co. in charge of its industrial heating engineering division, and previous to that was identified with Salem Engineering Co., Salem, O., and Philadelphia Drying Machine Co., Philadelphia.

♦ ♦ ♦

James E. McMullen has been named assistant to the president of Colorado Fuel & Iron Corp., Denver. Heretofore he served as an accountant for the company.

Stockholders re-elected the following board of directors: Bertram Cutler, Carl J. Schmidlapp, Cyril J. C. Quinn and Arthur Roeder, all of New York, and the following from Denver: John Evans, Fred Farrar, W. A. Maxwell Jr., S. G. Pierson and J. F. Welborn. Arthur Roeder was re-elected president and other officials were reappointed. Messrs. Cutler, Schmidlapp and Roeder make up the executive committee.

♦ ♦ ♦

D. D. Fennell, consulting engineer of Chicago, has been elected president, National Safety council, Chicago. After graduating from Hiram college he studied mechanical engineering in Germany and Switzerland. He majored in thermo-dynamics and was awarded degrees of mechanical engineer and a Ph. D. in science. For nine years he specialized in combustion engineering and development of economics in power plants. For the last 20 years he has been a consulting engineer in management problems.

Among those on the new executive committee of the council are: Frank Harrison, Chicago, assistant works manager of International Harvester Co., vice president for industrial safety, and A. V. Rohweder, Duluth, supervisor of safety and welfare, for Duluth, Missabe & Iron Range Railway Co., vice president for community councils.

♦ ♦ ♦

Lester G. Schraub, for the past nine years manager of sales for the wire division, Sheffield Steel Corp., Kansas City, Mo., has become general sales manager, Union Wire Rope Corp., Kansas City, effective Oct. 15. Mr. Schraub brings to his new position a background of 23 years experience in the steel and wire business. He served 14 years with Keystone Steel & Wire Co., Peoria, Ill., attaining the position of assistant sales manager, prior to assuming charge of wire division sales for the Sheffield corporation.

William J. Kelly

Chicago industrial executive and civic leader, who has been elected president, Machinery and Allied Products institute, as reported in STEEL, Oct. 18, page 24

♦ ♦ ♦

C. A. Ohl has been appointed director of sales and engineering, Bendix-Westinghouse Automotive Air Brake Co., Pittsburgh. Heretofore he served as director of sales and acting director of engineering.

Fred L. Hall, formerly eastern district manager, with headquarters in the Empire State building, New York, has been appointed sales manager, and has been transferred to the general offices at Pittsburgh.

R. H. Casler, formerly district engineer in the central district, with offices at Detroit, has been named chief field engineer and will be located in Pittsburgh.

Replacing the large central and eastern districts, the Bendix-Westinghouse field organization will be divided in accordance with the locations of the various district offices. Under this new plan the district offices reporting to the sales manager at Pittsburgh, will be as follows: New York, I. F. Nelis, district manager; Boston, W. F. Mahan, representative in charge; Atlanta, Ga., C. R. Mitchell, representative in charge; Washington, H. D. Neighbours, representative in charge; Philadelphia, E. G. Smith, reporting to New York office; district engineer, headquarters at New York, A. R. Leukhardt; Chicago, W. C. Canann, district manager; Denver and Minneapolis, representative in charge reporting to the Chicago office; Cincinnati, A. J. Bent, representative in charge; field engineer, located at Chicago, W. D. Foltz; Detroit, A. V. Howe, district manager; field engineer, W. W. Lowe; Cleveland, J. P. Weber, in charge of factory accounts, and A. E. Wolfe, in charge of retail sales; Canada, H. W. Jackson, representative in charge.

Lester G. Schraub

Died:

WILLIAM R. SWEATT, chairman of the board, Minneapolis-Honeywell Regulator Co., Minneapolis, in that city, Oct. 12.

♦ ♦ ♦

Fred W. Priep, 68, president, Laclede Stoker Co., St. Louis, in St. Louis, recently.

♦ ♦ ♦

Morgan W. Hall, 68, for 23 years a mechanical engineer for Jones & Laughlin Steel Corp., Pittsburgh, Oct. 18 at Dubois, Pa.

♦ ♦ ♦

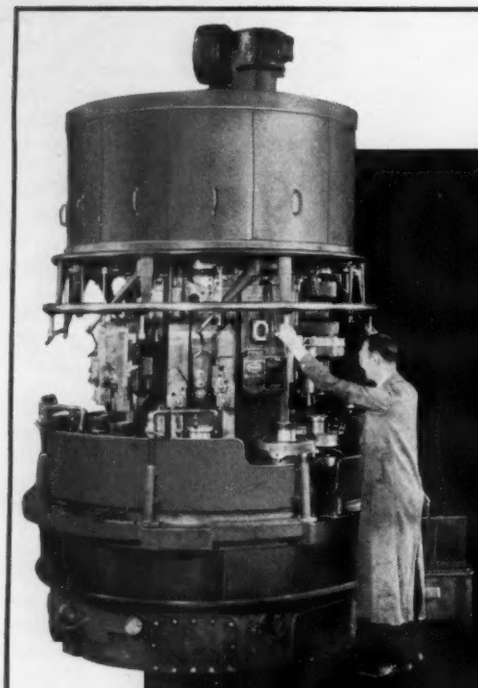
Hugh Henderson Davis, 83, former president, Monongahela Tube Co., at his home in Sewickley, Pittsburgh suburb, Oct. 15. Mr. Davis was one of the organizers of Monongahela Tube Co. and its last president when it was bought by Carnegie Steel Co.

♦ ♦ ♦

Charles E. Hildreth, 70, for many years engaged in the manufacture of machine tools, Worcester, Mass., in that city, Oct. 8. He formerly was active as a member of the New England Foundrymen's association and National Metal Trades association.

♦ ♦ ♦

Norman E. Craig, retired Ohio river captain, at his home in Beechview, a Pittsburgh suburb, Oct. 11. He held a pilot's license 55 years and has served in the employ of Carnegie-Illinois Steel Corp., Jones & Laughlin Steel Corp., and Pittsburgh Coal Co.



PROFITABLE LOGIC

Select

MULT-AU-MATICS

for Improved Profits

1. Fast multiple operations. A finished piece in the time of the longest operation plus a few seconds for index.
2. Maintained Accuracy assured on finished work for long periods of production eliminates large volume of rejects, eliminates frequent shutting down of machine for resetting or alignment of tools, and eliminates expensive inspection methods.
3. Design and construction provide versatility in tool change-over from one class of work to another at minimum expense.
4. If others can Profit with these machines, so can You.

Let Bullard Engineering Service prove the Profitable Logic of using Mult-Au-Matics either on your long runs or the comparatively short runs..**TODAY**..Save Time ..Send Bullard your prints or samples for Estimates..**TOMORROW**..Save Money via The Mult-Au-Matic Method.

THE BULLARD COMPANY

BRIDGEPORT · CONN

BULLARD

MIRRORS OF MOTORDOM

DETROIT

TOM-TOM beaters, as one writer has dubbed automotive publicity forces, are having their inning these days, evidenced by the steady flood of photographs and descriptive material pouring from the various merchandising headquarters singing the virtues of the motor industry's new creations. By actual measurement, the stack of releases received on Chevrolet hit 2¼ inches.

With eyes focused on the New York automobile show this week, it may be timely to dig into some of the new features of 1938 models. The tom-tom beaters have had to scratch pretty hard for material this year in view of the scarcity of major changes in designs, but still there are a number of developments of interest to the metals industries.

Chevrolet Boasts of New Clutch

Chevrolet, for example, will have for one of its main talking points its new diaphragm-type clutch of stamped spring steel, shown in an accompanying illustration. Dubbed the "Tiptoematic" clutch, it provides lighter pedal pressure, softer and more uniform engagement and smoother operation. To conform to the new design, the clutch pressure plate and cover are new, as well as the forged steel clutch fork, the ball throwout bearing and flywheel, the latter reduced in weight by some 5 pounds.

The Chevrolet radiator grille is made in two sections, which may be removed easily. Louvres, headlamps, hardware, hood side panels and running boards have been redesigned. Rear tread has been widened from 57 9/16 inches to a full 59 inches, adding to stability and body space.

An innovation in attaching rear springs to rear axle housing is claimed to give quieter operation. The springs are insulated from the housing by bushings and washers of live rubber, used in conjunction with a new bracket welded to the front of the housing on each side. Metal-to-metal contacts are eliminated. Wall thickness of the housing has been increased from 0.140 to 0.146-inch. On the Master series, the conventional I-beam front axle and semielliptic springs have been substituted for the former enclosed coil spring units.

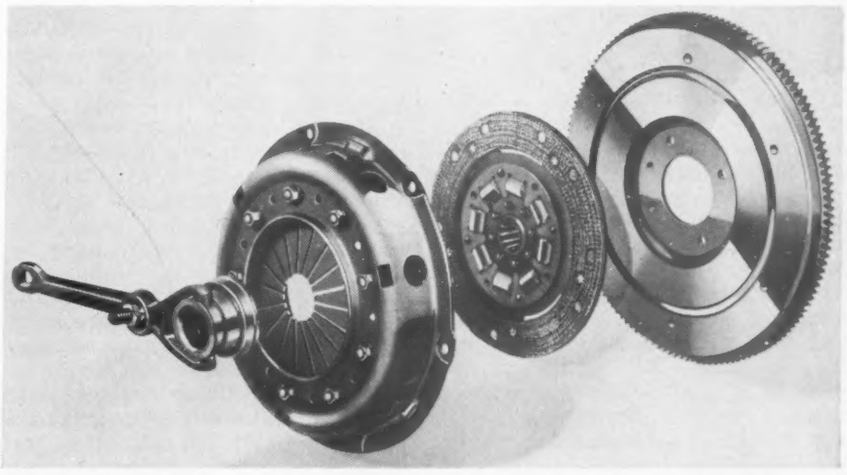
BY A. H. ALLEN
Detroit Editor, STEEL

Plymouth enters its tenth anniversary year with an improved steering system; more room inside bodies; deeper fenders; 12 per cent greater visibility through a larger, stationary windshield; a new front seat mechanism which raises the seat slightly as it is moved forward, giving short drivers a break; redesigned clutch which requires 15 per cent less pressure; and several other minor improvements.

In the new steering system, the overall ratio has been reduced to 17.6:1. Another improvement is the use of roller bearings at the top of the kingpin instead of the former bushings.

Speaking of Plymouth, a test car is being put through its paces around Detroit. Instead of the conventional 6-cylinder power plant is a V-8 engine which gives the same horsepower, same displacement and improved economy, with a reduction in weight from the present 600-odd pounds to around 430 pounds, or about 33 1/3 per cent.

Diaphragm Spring in New Chevrolet Clutch



DIAPHRAGM spring of stamped spring steel is the central feature of the new Chevrolet clutch. This member is dish-shaped, with 18 tapering fingers pointing inward. When the clutch is engaged, disk is flat while the entire rim bears against the pressure plate. Pressure of the throwout bearing on the inner ends of the fingers causes a diaphragm action, the outer ends of the fingers pivoting on the foremost of two fulcrums provided by two rings, one on each side of the spring. This causes the rim to move away from the clutch disk, disengaging the clutch. Entirely new as an automotive clutch, it requires only 75 per cent of former pedal pressure, reduces friction in the operating mechanism, provides uniform load distribution

MIRRORS OF MOTORDOM

Despite the fact that Chrysler engineers have long been none too enthusiastic about the V-type engine, the favorable performance of this experimental plant, which features aluminum pistons, aluminum head and aluminum flywheel housing, may presage a change in Chrysler policy.

Three inches have been added to the wheelbase of new De Soto models to get away from excessive overhang at the front and to provide more room in bodies. The new die-cast radiator grille continues the familiar De Soto front lines, the chrome-plated horizontal bars sweeping back along the hood side to form louvres. Wide, high-crowned fenders, with a suggestion of a "crease" in the center, carry the headlights which naturally are set wider apart. Windshield has increased glass area and is of the stationary type.

Frame has been strengthened, being about 5 inches wider at the dash line and 7 inches wider where the steering gear is attached. Side rails have been increased to a full 6 inches in depth. Brakes have 10 per cent greater capacity. Feature of the new steering wheels is the three-spoke open-top design which permits a clear view of instruments from the driver's seat.

TWO series—the Royal and Imperial—will comprise the Chrysler line for 1938; wheelbase on the former is lengthened 3 inches, on the latter 4 inches. Airflow models, pioneered by Chrysler several years ago, will not be continued as such, although the principles of construction have been extended to the new lines. Hoods have been redesigned completely, and the new radiator grille resembles that of the De Soto. The grille proper rests on a rounded metal panel extending forward below the grille and curving to conceal the structural members below. In the center of this panel is a series of V-shaped chrome louvres, while two pleats on either side of the V-section relieve the expanse of sheet metal. Headlamps are set into the fenders.

Torque of the Royal engine has been stepped up by lengthening the stroke ¼-inch. Engine for the Imperial model also has been improved by a ⅜-inch longer stroke.

Automobile Production

Passenger Cars and Trucks—United States and Canada
By Department of Commerce

	1935	1936	1937
Jan.	300,335	377,244	399,634
Feb.	350,346	300,810	383,698
March	447,894	438,943	519,177
April	477,059	527,625	553,415
May	381,809	480,518	540,357
June	372,085	469,368	521,139
July	345,297	451,206	456,909
Aug.	245,075	275,934	405,064
8 mos.	2,919,900	3,321,648	3,779,393
Sept.	92,728	139,820	*192,400
Oct.	280,316	230,049	.....
Nov.	408,550	405,799	.....
Dec.	418,317	518,958	.....
Year	4,119,811	4,616,274	.....

Estimated by *Ward's Automotive Reports*

Week ended:

Sept. 25	28,030
Oct. 2	44,330
Oct. 9	71,958
Oct. 16	89,680
Oct. 23	91,905

	Week ending Oct. 23	Oct. 16
General Motors	44,970	43,600
Ford	765	300
Chrysler	27,675	27,250
All others	18,495	18,530

*Estimated

The third engine for the Chrysler line, used in the Custom Imperial, remains unchanged dimensionally. Brakes and frames on all models have been strengthened.

Roomier interiors and restyled front ends are talking points on the Hudson lines for 1938, including the Hudson six and eight, and the Terraplane six. Interiors of some models are brightened considerably by use of garnish moldings and other trim in a dull chrome finish.

Engine connecting rods are heavier, and the rod and cap are now finish-machined after completely assembled, permitting greater accuracy and uniformity. Transmission case is heavier and ribbed to provide more rigid bearing support. Shafts are stiffer and stronger as a result of the use of involute-type splines in place of the conventional type. Rear tread has been increased 1½ inches on all models.

Prices on the Hudson line are higher by $13-$27, or less than 2 per cent on the volume models. As regards prices, three other companies announced increases last week—Plymouth from $65 to $95; Lincoln Zephyr from $110 to $130; and Nash from $5 to $60.

Pontiac is making available as optional equipment a new type of remote control shift lever located just beneath the steering wheel, thereby clearing the floor in the front compartment. The small lever has four speed locations similiar to the H-pattern in conventional use, except the lever is moved up and down instead of sidewise in transferring from the reverse-low to the second-high positions. A series of cable controls and ball and socket joints transfers this movement into the transmission. The system was designed by Pontiac engineers, marking the culmination of a reported six years of research.

PACKARD last week took delivery of the huge dies required for stamping its steel tops, after receiving approximately 10,000 of the completed tops for initial assemblies. As an indication of the size of the dies, the trim and flange die for the 5-passenger car roof weighs 119,000 pounds, while the draw die for the 7-passenger roof scales a mere 140,000 pounds. Due to the nature of the work, a considerable weight of tool steel lining is used in the dies.

With production running around 2500 cars weekly, Packard is in a fair way toward working off heavy stocks of parts built up in the plant, although the storage of completed tops is a problem.

Before start of production on 1938 models, Packard made a material buy for 25,000 cars, and followed this purchase up with a duplicate buy. Because of storage difficulties, the scheduling department is being forced to delay deliveries on much of this material, some being deferred to December and after, originally scheduled for receipt in November.

First pictures of the new Graham reveal a striking exterior design which goes beyond anything thus far seen in motordom for 1938. Built in three models on 120-inch wheelbase, the most unusual feature is the front end treatment. The radiator grille at the top extends outward, profile of the grille being at an angle of about 20 degrees back in from the vertical. The grille itself comprises four wide horizontal fins of bright metal set off by 12 narrower fins between them, the top three extending back the full length of the hood. The top band of bright metal also extends back the full length of the body. Headlamps are worked into the fender contour in novel fashion, with the glass lenses in the lamps conforming to the contour of the fender.

WINDOWS OF WASHINGTON

BY L. M. LAMM
Washington Editor, STEEL

WASHINGTON

THERE is no question that the department of justice has decided something must be done about revision of the anti-trust laws.

Robert H. Jackson, assistant attorney general in charge of anti-trust prosecution, has sold the idea to the attorney general and the latter apparently has just as definitely sold it to the President.

It seems certain that the matter will be put up to the next session of congress but it appears just as certain that it will take more than one session, especially a short one, to thresh it out and enact a new law or drastically amend the present one, the claim being that the present law is completely outmoded.

"American business must make up its mind whether it favors regulation by competition, contemplated by our anti-trust laws, or the only probable alternative, government control," Jackson said recently.

Wants "Consistent Policy"

"Every step to weaken anti-trust laws or to suspend them in any field, or to permit price fixing, is a certain, even if unknown, step toward government control."

The assistant attorney general went into considerable detail about identical bids received by the government.

"I am not now passing judgment as to whether these bids are the result of punishable conspiracy," he said. "But they certainly were not the result of identical costs of manufacture, nor of independent estimates. They are the product of artificial marketing machinery. Our anti-trust laws are often interpreted to prohibit methods rather than results. What may be illegal if accomplished one way, is held to be legal, if accomplished in another."

Jackson, during the course of his talk said that there is no stated or intelligible policy which differentiates pursuit of industrial efficiency from industrial empire building.

"I am interested in the establishment of a consistent national policy of monopoly control, intelligible both to those expected to comply with it and those expected to enforce it."

HOUR-WAGE LEGISLATION FAR FROM DECIDED

Industry probably will be more interested in the hours and wages bill than any other measure pending when the special session of congress convenes Nov. 15. To that end there has been much talk, both in industry and among the members of congress.

Several hours and wages bills have been drafted in tentative form and there is talk that the bill which passed the senate at the last session and was held up in the house by the rules committee, may never see the light of day again. Of course, the pending measure is not at all in accord with the ideas of southern legislators and they, with the Republicans, may be able to keep that particular bill from being acted upon.

An influential member of the house and a prominent member of the senate have together made a tentative draft of a bill which they propose to introduce during the early hours of the coming session. It deals with the "substandard labor condition" and will be in the nature of a substitute to the bill now pending in the house. It does not mention any specific hours or wages and the bill would be an amendment to the federal trade commission act. The bill is causing considerable flurry in industrial circles.

Referring last week to proposed hours and wages legislation pending in the house when Congress convenes. William B. Warner, president of the National Association of Manufacturers, said that, "if its inherent dangers were understood by those who must operate plants under its provisions, by the workers who face new burdens upon employment. and by farmers who must pay a great proportion of the increased production costs, the measure would not pass congress."

The association has had distributed a special analysis of the bill and is urging "special efforts to inform the nation of the contents and probable effects of the bill."

The analysis enumerates the outstanding provisions of the bill as originally introduced, and shows the changes made in the senate and in the labor committee of the house.

Mr. Warner said that, "much is made of the fact that this bill would exempt certain groups, like farmers. But that very exemption is a declaration by congress of its belief that it does have the power to fix wages and hours for farmers and is, furthermore, a warning that it may do so in the future."

LABOR RELATIONS BOARD DEFENDS ITS COURSE

The national labor relations board, harassed not only by industry and members of congress but by both the CIO and the A. F. of L., is taking the matter seriously enough to issue a statement in defense, particularly because of the attitude of the labor unions.

The board pointed out in its statement that the conflict between the two major labor organizations may tend to obscure the fundamental results of the board's operations under the labor relations act.

Naturally, the board points out, "decisions as to what constitutes the proper unit for collective bargaining cannot completely satisfy both the A. F. of L. and the CIO as long as the craft industrial union issue continues to divide the ranks of organized labor. In making decisions as to the bargaining unit the board acts in a judicial capacity, and has never entertained the hope that it could satisfy both litigants while

they are engaged in what is to them a bitter and decisive struggle."

It is further stated that "the essential purpose of the labor relations act is to protect all workers in their right to organize into unions of their own choice. The energies of the board are chiefly devoted to the protection of this right against interference by employers. That this right is now being widely and freely exercised is demonstrated by figures made public at the conventions of the A. F. of L. and the CIO. These figures show that in the past year, during only half of which labor has had the benefit of the Supreme Court decisions sustaining the act, about four million additional workers have joined."

BUSINESS LEADERS TO TALK FOR COMMERCE DEPARTMENT

W. Averill Harriman, chairman of the Roper business advisory council, talking on the radio last week at the first of the autumn broadcasts of the department of commerce, discussing "management's job," said that various companies in the past have pioneered in benefits "and almost all of the social objectives of the new deal have at one time or another been first undertaken by management.

During the past year the commerce department put on weekly broadcasts on various businesses of the country. This year the department has added a talk by a member of the Roper conference. It is expected that at a date not yet set E. R. Stettinius Jr., chairman of the finance committee of the United States Steel Corp. and Ralph E. Flanders, president of Jones & Lamson Machine Co., Springfield, Vt., will give talks.

"There are lots of steps in the process, of course, between the raw materials and the finished goods," said Harriman, "it sometimes seems very complicated, but it all comes down to this: American industry and business are working for you. Management is working for you. If management can't supply the goods and services you want at the prices you can pay, management fails.

"So, in American life, management has three groups to satisfy, the millions of investors, the employes, and last and most important of all, you men and women, and particularly the women, who control the purse strings."

ARMY-NAVY ACTIVITIES KEEP UP PREPAREDNESS

There is no reason why every business man in the country should know about government routine. They don't. That is probably one of the reasons why, when one sees a story in the daily press to the effect that the war agencies of the government are increasing their programs, they are apt to believe the story.

Certainly on the surface, the war and navy departments are not hastening the speed of their work. This is due in part at least to the fact that they are bound in their expenditures to stay within what they were allowed by congress for the fiscal year. For instance, at present they are operating under the 1938 appropriation, which became available July 1 of this year and will end June 30 of next year. They can use what money was appropriated at the last session of congress and no more unless they create a deficit, which is not being done and which is only done in case of an emergency.

Funds allowed by congress for the army and navy have been larger than normal in the past two or three years, but this is due in part to the fact that the President has encouraged preparedness.

If the army and navy are not rushing their plans it does not mean that they are not keeping up with the procession. Both of these departments have war planning units, in which names, addresses, capacities, and other essential war information has been compiled in case of emergency. This information also, is kept up to date. It had its foundation in the mass of information that the war industries board had on hand at the end of the World war. This has been kept current. There is no question the government would be in far better position now than at the beginning of the World war, in case of necessity.

SEVEN BILLIONS FOREIGN MONEY IN U. S. INDUSTRY

Foreign investments in the United States at the end of 1936 amounted to more than $7,600,000,000, according to a survey just completed by the finance division of the department of commerce. This is said to be the high point of foreign holdings in this country.

Commenting on the report, Secretary of Commerce Roper pointed out that "the computations showed that foreign investments in manufacturing enterprises in the United States comprise approximately 30 per cent of the total investments. About one-half of the common stock holdings, one-third of the direct investments, and nearly one-third of the preferred stock holdings are in the manufacturing group."

Mr. Roper stated that it is believed that American investments abroad amounted to about $13,000,000,000 at the end of 1936.

ADVERTISING IS IMPROVED

No new federal control legislation is needed to regulate methods of advertising, the distribution committee of the United States chamber of commerce says in a report just made public.

"The efforts to improve advertising practices and to lessen the need for reliance upon legislative controls," says the committee, "are noteworthy for their thoroughness and effectiveness. * * * These activities have materially reduced misleading advertising, with the consequence that distinct benefits have accrued to the public."

The committee reviews methods dealing with advertising adopted by advertisers, advertising agencies, publishers, better business bureaus, merchants' associations and trade associations, and declares it is impressed by the record made in establishing procedure in the public interest.

Foundry Equipment Orders Decline in September

Orders for foundry equipment in September declined slightly from those of August, according to statistics of the Foundry Equipment Manufacturers association. The net order index for September was 231.8, compared with 257.5 in August and 161 for September, 1936. Shipment index for September was 235.4, for August 266.6 and for September, 1936, it was 150.5. Unfilled orders declined slightly to 347.5 in September from 251.1 in August, compared with 162.8 in September, 1936.

The three months average of gross orders made a gain from 229.9 in August to 231.2 in September. The index of three months average of machine tool and forging machinery orders in September was 337.5 compared with 326.1 in August and with 238 in September, 1936. Indexes are based on averages of 1922-24 as 100 per cent.

Steelmaker Sees Large Auto Demand in 1938

That 1938 will prove to be another large year for automotive production is the belief of E. J. Kulas, president of Otis Steel Co. and Midland Steel Products Co., Cleveland.

"It is too early with any degree of certainty to predict," Mr. Kulas says, "that 1938 will run up as high a total as 1937. Present estimates indicate that the turn of the year will show a production of almost 5,000,000 motor cars and trucks in the United States for 1937. If production next year went down as much as 10 per cent, the total would still be far above the average and large enough to assure satisfactory volume for manufacturers serving the automotive industry.

"Our own companies, large suppliers of steel and steel products to the automobile trade, anticipate a continuing satisfactory volume in 1938."

Public Opinion Will Support Prompt Action on Two Correctives

WHEN business falters and the securities markets skid sickeningly as they did last week, the temptation to seek out a ready scapegoat and to attach to it the entire blame for the calamity is overpowering.

For several years following the precipitous declines of 1929 it was popular to blame everything upon speculators, bankers, investment trusts, and other individuals and organizations identified with high and frenzied finance. Today the temptation is to heap the blame for the conditions which led to last week's debacle upon politicians whose experimental regulatory legislation, it is alleged, is strangling business.

Broad charges, such as these, seldom are accurate or just. It has been pretty well established that the crash of 1929 was caused not by the sins of any particular class of individuals but by the mistakes of persons in many lines of activity. Likewise, it will be found that the dip of October, 1937, was not attributable to a single, easily identified cause or to the action of any particular group of persons but to a combination of numerous factors in which individuals of many factions participated.

Assigning Blame Is Waste of Time, Better Course Is To Apply Prompt Remedy for Past Errors

Therefore, little is to be gained by trying to hang this unsavory episode upon economic royalists, new dealers, labor union czars, or other handy scapegoats. More to the point will be prompt measures to correct some of the mistakes which obviously are responsible for our present difficulties.

Two such mistakes stand out so plainly that corrective action could be taken early in the approaching session of congress—providing public opinion will not be diverted from its will by the power of strongly organized minorities:

Jobs for Next Congress: Modify Tax Bill and Change Wagner Act To Give Everyone Square Deal

1. Abandon or modify the federal tax on undistributed profits. The treasury department and the President's advisors claimed that this tax would yield additional income for the federal treasury. It has produced far less revenue than expected and it has frightened and confused industry to the point where needed expansion and rehabilitation work has been abandoned.

2. Change the one-sided Wagner act so that it gives the employer at least a sporting chance to protect his company and his employes from the depredations of irresponsible labor unions. If it pains the government too much to do this in the name of fair play for employers, let it do it for the sake of decently managed unions.

Correct these two evils and the nation will be better fortified against a recurrence of last week's unnecessary purge.

STEEL'S INDEX OF ACTIVITY
In Iron, Steel and Metal working Industries
Based upon freight car loadings, electric power output, automobile assemblies (Crum's Reports) and steelworks operating rate (STEEL). Average for 1926 equals 100, weighted as follows: Steel rate 40, and carloadings, power output and auto assemblies each 20
Per Cent
1937
1936
1929
1930
1931
1932
1933
1934
1935
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

STEEL'S index of activity gained 2.9 points to 101.9 in the week ending Oct. 16:

Week ending	1937	1936	1935	1934	1933	1932	1931	1930
Aug. 7	107.3	98.7	64.6	73.4	74.7	45.1	67.0	85.6
Aug. 14	113.8	92.6	71.5	61.4	74.2	44.6	67.4	86.2
Aug. 21	110.3	97.9	77.0	60.3	71.6	44.9	67.3	88.5
Aug. 28	108.5	94.0	77.3	55.1	70.3	45.2	66.5	87.4
Sept. 4	104.8	87.5	70.9	53.5	65.5	45.4	65.3	79.0
Sept. 11	94.3	83.1	70.1	58.7	69.1	44.9	60.9	85.0
Sept. 18	95.0	90.1	69.4	58.1	68.2	47.8	65.6	86.2
Sept. 25	93.0	86.2	68.5	89.3	66.9	48.0	65.2	83.8
Oct. 2	96.6	89.0	73.3	54.7	67.4	47.7	62.4	81.0
Oct. 9	99.0†	93.4	74.9	56.4	66.0	48.4	61.5	79.4
Oct. 16	101.9*	95.5	77.4	58.2	60.9	48.7	57.9	77.5

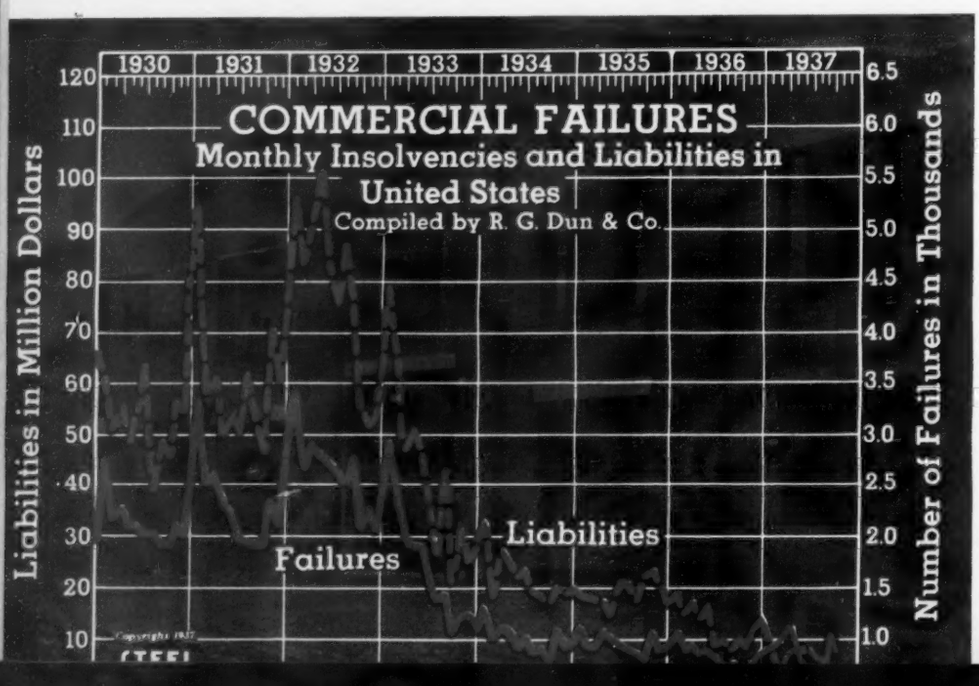
†Revised. *Preliminary.

Market Crash Will Test Industry's Resistance to Shock

READERS may well wonder at the persistency with which STEEL's index of activity in the iron, steel and metalworking industries, charted at the top of this page, has continued upward in October in the face of the discouraging developments in the securities markets and in the volume of new business during recent weeks.

From a low point of 93.0 in the week ending Sept. 25, the index has mounted steadily to 101.9 in the week ending Oct. 16. Present indications are that for the week ending Oct. 23 the index will show little, if any, gain and it may register a slight loss.

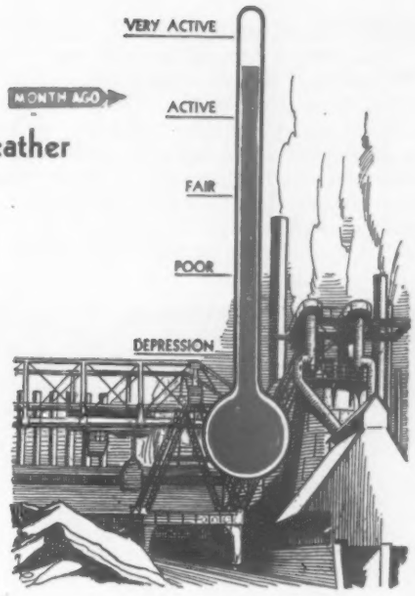
The basic reason why the index has risen when so many other barometers have been declining is that the fluctuations in the various lines of industry—some of them diametrically opposite in trend—have produced an *average* which until mid-October had tended upward. For instance, the decline in the rate of steelworks operations, which is the most heavily weighted factor in STEEL's index, was more than offset by the increase in automobile production. Again, while freight car loadings—now in the seasonal peak period of the year—are somewhat below expectations, their deficiency has been compensated for in part by a continuing high rate of electric power output.



	Failures, Number		Liabilities, Dollars (000 omitted)	
	1937	1936	1937	1936
Jan.	811	1,077	$8,661	$18,104
Feb.	721	856	9,771	14,089
March	820	946	10,922	16,271
April	786	830	8,906	14,157
May	834	832	8,364	15,375
June	670	773	8,191	9,177
July	618	639	7,766	9,904
Aug.	707	655	11,916	8,271
Sept.	564	586	8,393	9,819
Oct.	.....	611	.....	8,266
Nov.	.....	688	.....	11,532
Dec.	.....	692	.....	12,288

BUSINESS TREND

Industrial Weather



TREND:
Upward

Incidentally, revenue freight car loadings probably show as reliably as any index the true measure of the present unsteadiness in business. Loadings in 1937 weeks had remained well above those in the corresponding weeks of 1936 until Labor day. From there on the margin became noticeably smaller until in the week ending Oct. 9, the 1937 volume fell below that of the corresponding 1936 week by about 5000 cars. In the week ending Oct. 16, the 1937 figure was still lower in relation to last year's record.

Right now the pertinent question in industry is "To what extent has the stock market crash of last Tuesday shaken confidence and caused the postponement of intended purchases of materials, supplies and equipment?"

The answer will be found in the developments of the next few weeks. Perhaps sentiment in some quarters was depressed unduly by the recent sharp declines in the weekly steel rate. Its plunge into the fifties need not be considered a major disaster providing new demand from the automobile and other large consuming industries rallies in the near future. Inventories—swelled by forward purchasing last summer in anticipation of higher prices and labor trouble—are not sufficiently large to cause a prolonged postponement of buying.

Where Business Stands

Monthly Averages, 1936=100

	Sept., 1937	Aug., 1937	Sept., 1936
Steel Ingot Output	114.4	124.3	106.4
Pig Iron Output	135.9	139.2	108.5
Freight Movement	114.7	112.3	110.3
Building Construction	94.8	123.2	103.8
Automobile Production	50.0	96.1	36.3
Wholesale Prices	108.6	110.9	100.5

The Barometer of Business

Industrial Indicators

	Sept., 1937	Aug., 1937	Sept., 1936
Pig iron output (daily average, tons)	113,937	116,676	90,942
Machine tool index	187.2	180.9	132.0
Finished steel shipments	1,047,962	1,107,858	961,803
Ingot output (daily average, tons)	172,075	186,992	160,043
Dodge building awards in 37 states (sq. ft.)	32,364,300	42,077,100	35,448,000
Automobile output	*192,400	405,064	139,785
Coal output, tons	38,620,000	33,984,000	37,200,000
Business failures; number	564	707	586
Business failures; liabilities	$8,393,000	$11,916,000	$9,819,000
Cement production (bbls.)	.....	11,894,000	12,292,000
Cotton consumption (bales)	.....	604,000	630,000
Car loadings (weekly av.)	795,736	778,927	765,280

*Estimated.

Financial Indicators

	Sept., 1937	Aug., 1937	Sept., 1936
25 Industrial stocks	$197.79	$220.18	$222.14
25 Rail stocks	$33.95	$30.13	$44.15
40 Bonds	$80.84	$83.63	$88.95
Bank clearings (000 omitted)	.....	$22,260,000	$23,927,000
Commercial paper rate (New York, per cent)	1	1	¾
*Commercial loans (000 omitted)	$10,004,000	$10,027,000	$8,753,000
Federal Reserve ratio, per cent	80.2	79.5	79.5
Railroad earnings	†$50,307,881	$60,557,576	$64,624,212
Stock sales, New York stock exchange	33,859,818	17,220,623	30,872,287
Bond sales, par value	$181,250,400	$148,009,375	$304,837,900

*Leading member bank Federal Reserve System.
†August, July and August, respectively.

Foreign Trade

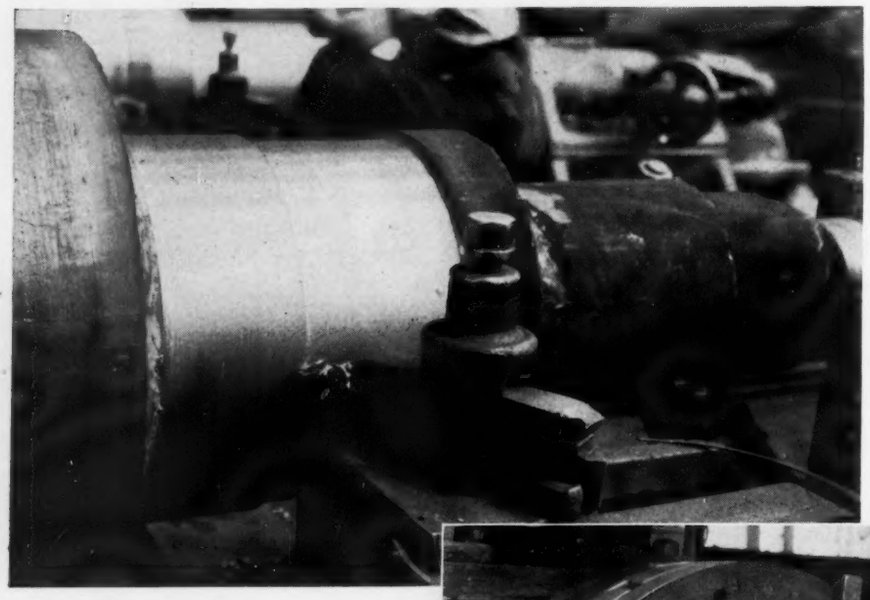
	Sept., 1937	Aug., 1937	Sept., 1936
Exports	.....	$277,695,000	$219,967,000
Imports	.....	$245,707,000	$215,525,000
Gold exports	.....	$105,013,000	$42,000
Gold imports	.....	$169,000	$171,866,000

Commodity Prices

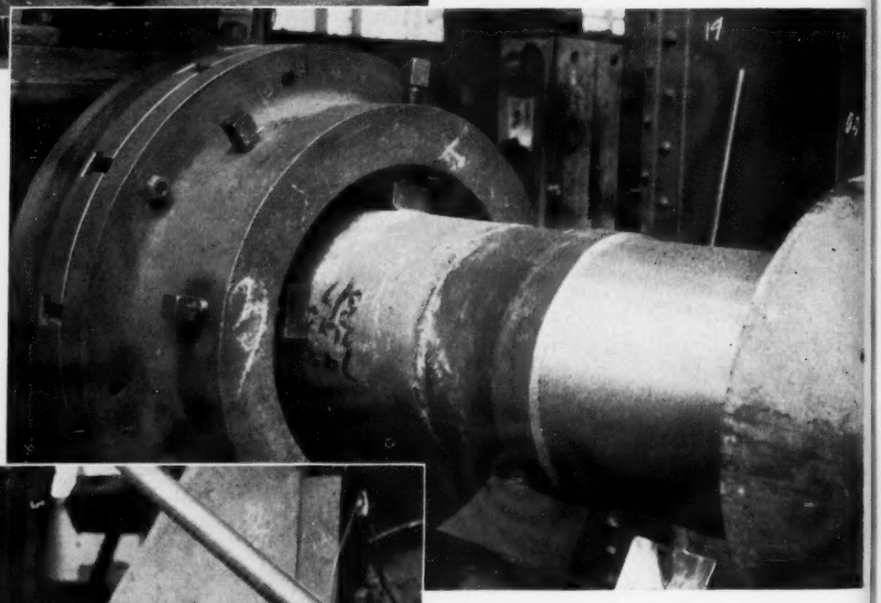
	Sept., 1937	Aug., 1937	Sept., 1936
STEEL's composite average of 25 iron and steel prices	$40.16	$40.34	$34.15
Bradstreet's index	$10.96	$11.19	$10.14
Wheat, cash (bushel)	$1.21	$1.22	$1.28
Corn, cash (bushel)	$1.20	$1.19	$1.26

Manufacturing

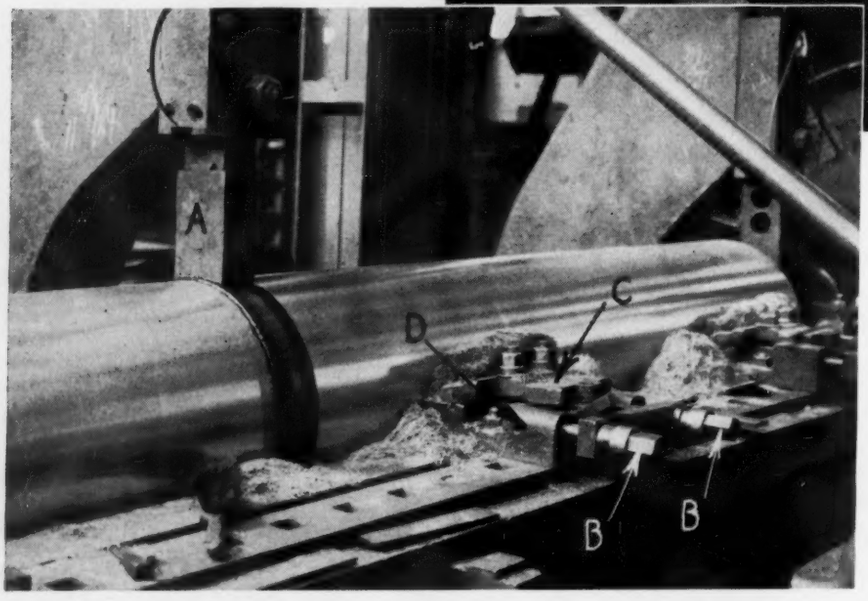
CHILLED iron, one of the hardest materials at the command of the engineer, must be worked slowly, patiently. Rolls made of chilled iron are used in reducing the thickness of steel, paper, rubber, linoleum and grain. For the past century American craftsmen have been carving chilled iron rolls, giving them mirror-like surfaces. In these pictures STEEL takes you to the plant of the Farrell-Birmingham Co. Inc., Ansonia, Conn., where rolls varying in size from 6 x 13 inches to 36 x 298 inches are cast and finished.



1. Rolls are cast in a vertical position in pits; necks and journals are cast in sand molds, coming out soft and easily machined while the bodies are cast in iron chills, coming out hard. Ordinary high-speed turning tools are used in turning journals, as shown above

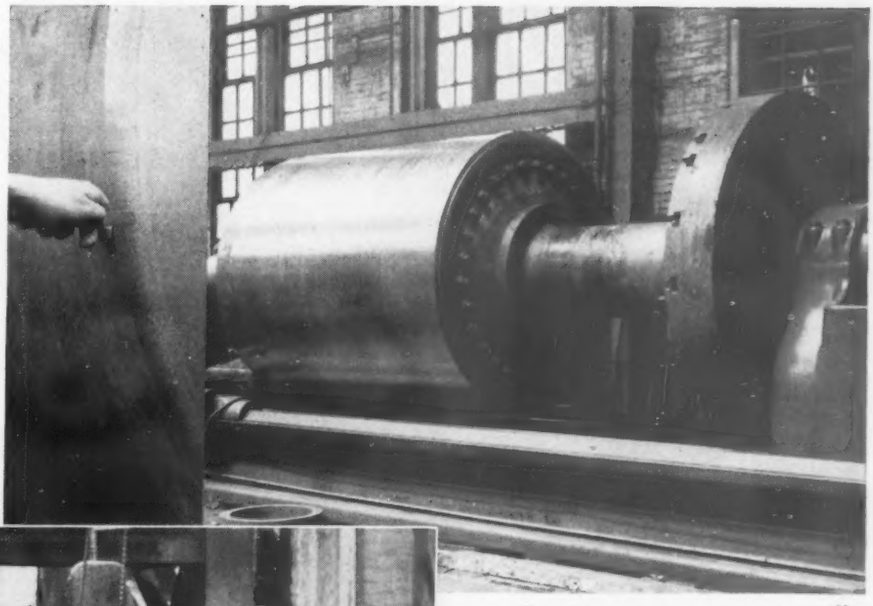


2. Here is the form of drive generally used in roll turning. A massive hollow fixture known as a "pocket head" is bolted to the lathe faceplate and the end of the roll neck is held securely in position by several square headed screws in the pocket head, making a substantial set-up which reduces chatter to a minimum

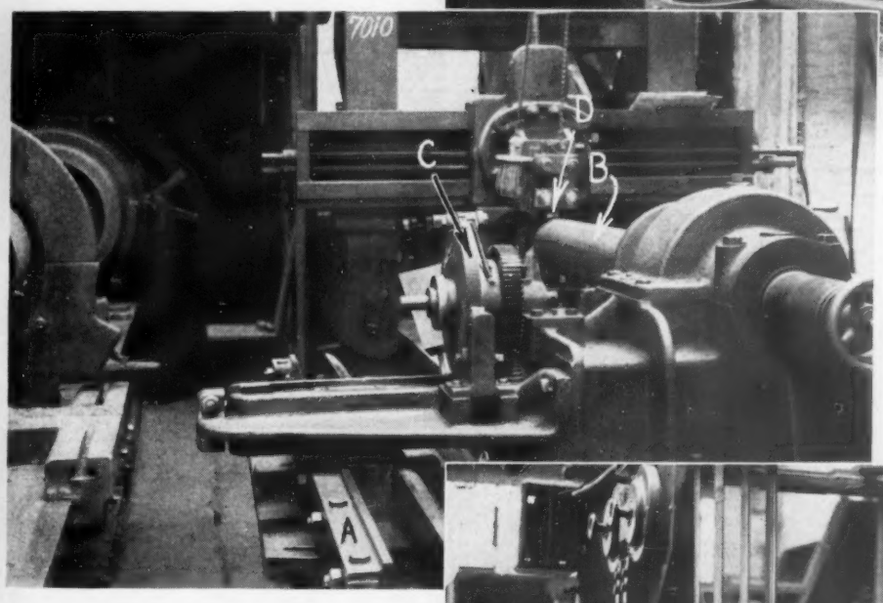


3. Turning the roll body is a different story. The paper machine breaker roll, cast from Farreloy, a development of the company's metallurgists, is supported by a substantial steadyrest at A. Roll lathes of this type have no carriages. Tools are clamped directly to the bed and are fed by turning the screws at B. Clamp at C holds the tool in the holder at D. Tools are of high carbon steel, have a cutting face of 6 inches, cut one foot in 50 seconds

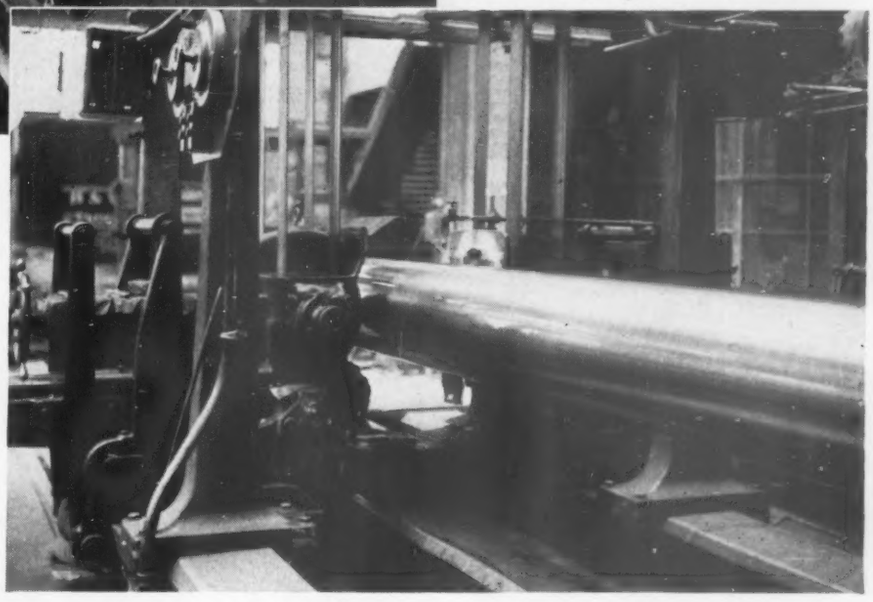
Chilled Iron Rolls



4. Some large rolls must be supported by bolting flanges on the ends of the body to support the enormous weight. This is a linoleum calender roll, 72 x 84 inches, chilled to a depth of 1½ inches as shown in the photo at right. It is mounted for turning in a 7 x 25-foot lathe

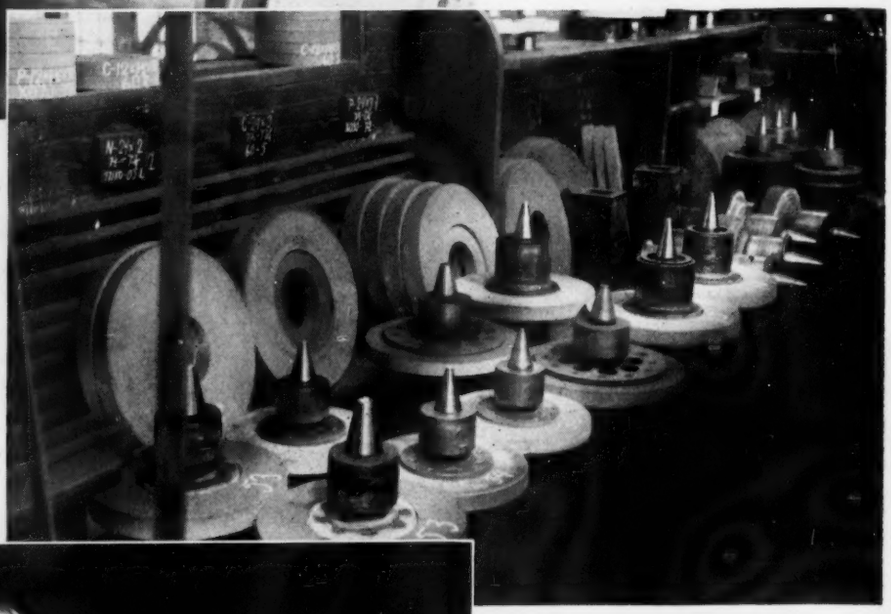


5. Corrugations are cut in rolls in a wide variety of shapes and sizes on an ordinary planer with an attachment like this for generating a spiral and feeding the roll radially at the end of each cut. Slide A can be set at various angles. It actuates mechanisms which turn roll B. Ratchet feed wheel C, advances at the end of each stroke, feeding the roll radially into tool D



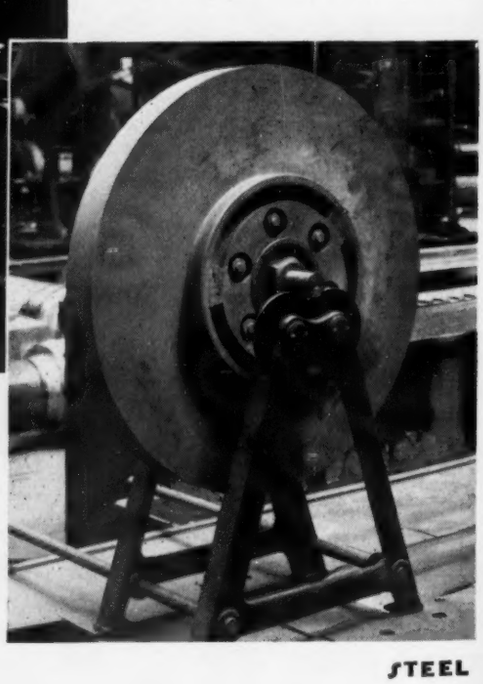
6. Precision grinding of rolls is done on this specially developed grinder. Two grinding heads are fed across the bed automatically, grinding both sides of the roll simultaneously. A special swing rest permits free lateral movement and insures a straight roll, without danger of transferring irregularities in the machine bed to the work. A special cam-operated device on the grinder enables the operator to make rolls concave or convex

7. Accurate measurements of diameters on large rolls are accomplished by this special caliper, mounted on a roller saddle. The bracket shown accommodates an anvil, while the opposite bracket supports a dial indicator. This device is a much more effective measuring device than a micrometer caliper for these large rolls



8. Tapered ends on the spindles of these roll grinding wheels fit into tapered boxes in the grinding machine wheel heads. The spindle is driven by two belts with a pulley on each side of the grinding wheel. This type mounting requires no thrust bearing, but spindle bearings must be readjusted with every wheel change

9. Single wheel grinders indicate the modern trend. The machine here illustrated is electrically driven throughout,



10. Accurate balancing is a prime necessity in obtaining a mirror finish. To obtain perfect balance, wheels on their hubs are placed on this balancing stand, which is fitted with a special arbor containing four hardened steel disks. Since the hub is provided with balancing blocks, when the heaviest part comes to rest at the bottom, these blocks are moved to balance it. This process is repeated until the wheel is stable

Metal Men Study Many New Ideas and Practices At Annual Convention

CAREFULLY selected to present news and views on all current developments in metals, this year's crop of papers proved of great interest to the large attendance at technical sessions of the American Society for Metals.

In the session held Monday morning, R. J. Cowan, Surface Combustion Corp., in presenting a paper prepared by himself and J. T. Bryce of the same corporation, declared that in the development of the process of dry cyaniding it was necessary to deal with a great many conflicting chemical reactions. It was soon discovered that the mere addition of ammonia to the carburizing gas was not satisfactory because of interfering reactions.

This was especially true, he said, in those instances where the carburizing gas included oxygen in any form. It was found that if the carburizing gas and the ammonia were entered together in the charging end of a continuous furnace, a series of reactions took place with the formation of water vapor, which then interfered with the subsequent desirable reaction and produced unsatisfactory results.

The results obtained in the tests proved it was necessary to separate the carburizing from the nitriding gases as they enter the furnace. It was found best to introduce the carburizing gas at the charging end of the furnace and to introduce the ammonia only at the points along the muffle where the work had come to temperature. By this means the objectionable reactions referred to above were overcome and it was possible to obtain consistent results.

The mechanism of steel hardening and tempering as indicated by coercive force measurements was discussed in a paper prepared by R. S. Dean, chief engineer, metallurgical division, United States bureau of mines, Washington, and Charles Y. Clayton, professor of metallurgy, Missouri School of Mines and Metallurgy. Findings presented confirmed the lack of parallelism between magnetic and mechanical hardness in steels; and to explain the relation between hardness and coercive force in steels subjected to various treatment the hypothesis was offered that in the hardening and drawing of steel the following steps take place:

(1) The grains break into blocks, thus forming internal surface which greatly increases coercive force; (2) the second phase is precipitated at the internal surface and greatly increases hardness; (3) the internal surface heals causing reduced coercive force; and (4) the precipitated phase agglomerates causing decreased hardness. The authors suggested possible uses for coercive force as a shop-control method.

Agree With Paper

In discussion, W. L. Fink and D. W. Smith, Aluminum Research Laboratories, New Kensington, Pa., stated that the paper by Dr. Dean and Professor Clayton expressed in slightly different terms conclusions similar to those which they had made concerning the age-hardening of aluminum alloys in a series of papers presented before the Institute of Metals division of the American Institute of Mining and Metallurgical Engineers.

The effect of tempering quenched hypereutectoid steels on the physical properties and microstructure was the subject of a paper by Charles R. Austin, and B. S. Norris, associate professor of metallurgy, Pennsylvania State college, State College, Pa., and graduate assistant, respectively.

Following a review dealing with reactions occurring in carbon steels below the eutectoid inversion, the authors discussed the difference in reaction to tempering hypereutectoid carbon steels, of similar chemical composition, after quenching from 1000 degrees Cent., in terms of electrical resistivity, magnetization—coercive force, Rockwell hardness and microstructure. The marked difference in the behavior of the steels, particularly with respect to graphitization at 650 degrees Cent. was illustrated by data obtained on the physical properties and by metallographic records.

Austenitic grain size in relation to thermal pretreatment and to quenching temperature was also discussed. Austenitic grain size, the authors declared, has an influence on the behavior of steels during tempering. This factor appeared to exert its influence by controlling the nature of the quenched structure, which in turn regulated the manner in which the carbides precipitate and further react during tempering.

Rapid photomicrography, effect of grain size on the oxidation of a low-carbon steel, and correlation of electromagnetic measurements and steel structures, were subjects considered in three papers presented at one of two afternoon technical sessions. R. L. Dowdell, professor of metallography, University of Minnesota, Minneapolis, and N. L. Mochel, metallurgist, Westinghouse Electric & Mfg. Co., Philadelphia, presided as co-chairmen.

Dealing with the first subject, Willard Mutchler and Henry O. Willier, assistant metallurgist, and junior physical science aid, respectively, national bureau of standards, Washington, described a rapid and relatively inexpensive method for making photomicrographs on a metallographic microscope, a method now being used successfully at the bureau. Although complete pictorial records may be advantageous in both metallurgical research and industrial practice, photography usually is reduced to a minimum because of time and cost requirements.

With the method described by the authors, an apparatus, designed to hold roll film or paper, is substituted for the individually loaded film holders used in ordinary practice.

To demonstrate the value of the method, the authors referred to the current investigation at the bureau of corrosion behavior of some 7000 specimens of aluminum alloy sheet materials, 9 x 0.75 x 0.064 inches. These specimens are exposed to corrosive conditions and groups are removed periodically for further tests in the laboratory. An important item consists in examining under the microscope four random cross sectional areas, each 0.5 x 0.064-inch, from every specimen.

The appearance of each area, at 50 diameters, is photographed on paper negatives, thus furnishing permanent records. Six separate exposures are necessary to make a complete picture of each 0.5 x 0.064-inch cross section, and upwards of 700 negatives can be made in an average working day. It is readily apparent that the accomplishment of this task by the commonly practiced methods of micrography would be prohibitive.

Effect of grain size on the oxidation of a low-carbon steel was dealt with in a paper by C. A. Siebert and Clair Upthegrove, assistant professor of metallurgical engineering, and professor of metallurgical engineering, respectively, University of Michigan, Ann Arbor, Mich. Temperature range considered was 1700-2100 degrees Fahr. A paper pre-

sented by the same authors in 1934 gave data on effect of temperature, time and partial pressure of oxygen on scaling of S.A.E. 1020 steel, and it was pointed out at that time that certain discrepancies were noted in the absolute numerical values of scaling between different 1020 steels.

Through subsequent investigation, the authors have found that the fine-grained steels oxidize to a greater extent than coarse-grained steels. The ferrous iron content of the scale found at any given temperature in this range is higher for the fine-grained steels than for the course-grained steels, which results in a greater rate of diffusion and therefore a higher scaling loss.

The authors feel that other factors than grain size influence the absolute numerical values of scaling. The decarburization which occurs along with oxidation may have a decided bearing on scaling. This will be considered in another paper on effect of carbon content on oxidation to be presented in the near future.

Describes Steel Tests

Procedure employed to correlate electromagnetic measurements and steel structures was described in a paper by Carl Kinsley, consulting engineer, New York. Nondestructive tests are made, by electromagnetic measurements with a dynamometer and subsidiary phase shifting transformers, of the uniformity of steel samples or of the character and amount of their differences.

Preparation of the testing circuit for the reception of the sample to be tested is of critical importance. Before a sample has been treated so as to change its structure, it is placed in the magnetizing coil and the electromotive force induced in the testing circuit is measured with respect to an empty coil—an air core.

This initial electromotive force, said Mr. Kinsley, is completely balanced by introducing into the circuit an equal, but opposing electromotive force. This is synthesized from the electromotive force derived from any convenient piece of steel supplemented by phase shifting transformers which term by term neutralize the induced electromotive force. The opposing electromotive force is called "balancing wave" and it has an opposite sign with respect to the corresponding induced electromotive force.

Each sample now is treated so as to change its structure. It is then placed in the magnetizing coil and the value of the additional electromotive force resulting from the treatment is obtained as a series of harmonic terms. Amplitude and phase angle of each of the significant terms of the complete wave is evaluated and their interpretation gives the character and the amount of the change produced in the steel sample.

The author gave illustrations of the metallurgical differences between the samples and between the different sections of the same sample, also of the effect of different tempering temperatures on similar samples which had been quenched alike. Significance of different phase angles with similar electromotive force waves was illustrated with superimposed curves. Relation of phase angle to character of the change in steel structure was pointed out.

In the alternate session held Monday afternoon Thomas G. Digges, metallurgist, national bureau of standards, Washington, outlined an investigation made as to the effect of carbon on the hardenability of high purity iron-carbon alloys. These alloys, varying only in carbon from 0.23 to 0.21 per cent, were prepared by carburizing vacuum-fused electrolytic iron in a hydrogen-benzene mixture. Homogeneity of the alloys was obtained by heating and cooling the carburized bars in vacuo, he revealed.

Discussing Mr. Digges' paper, R. Schempp, metallurgist, Halcomb Steel division, Crucible Steel Co. of America, Syracuse, N. Y., pointed out that a factor worthy of consideration was the influence of quenching temperature upon the critical cooling curve. Throughout this study, he asserted, a quenching temperature of 1700 degrees Fahr. was used to harden pure iron-carbon alloys, ranging from 0.23 to 1.21 per cent carbon, since it produces a constant austenitic grain size.

A new tool material was described by R. H. Harrington, research metallurgist, General Electric Co., Schenectady, N. Y. It is an alloy of 36 per cent cobalt, 8 per cent molybdenum, 6 per cent chromium, 1 per cent carbon, 0.4 per cent vanadium, with the remainder iron, and may be forged, cut, machined, welded and brazed, he said. The alloy may be precipitation hardened to a Rockwell A hardness of 88, about 72 Rockwell C. The speaker believed it gave promise of being a useful tool material in a class between high speed steel and the sintered carbides.

Commenting upon Mr. Harrington's paper, W. P. Sykes, General Electric Co., Cleveland, noted with interest the rapid decrease in hardness as the aging or tempering temperature was raised above 600 degrees Cent. After one hour at 600 degrees Cent. the hardness was below that of the quenched alloy.

A standard with respect to a test for hardenability and a method of expressing results in quantitative but simple terms were proposed in a paper prepared by J. L. Burns and T. L. Moore, members of the metallurgical staff, Republic Steel Corp., Chicago district, and R. S. Archer, chief metallurgist for Republic in that district.

The latter presented the paper and described details of testing procedure. The test was considered practical for regular use where close control of hardenability is economically justified. The maximum hardness attainable on quenching was shown to depend on carbon content alone, in the case of plain carbon and common alloy steels.

The hardness values at the surface and at various points within a quenched piece of steel define the penetration effect, he said, an effect that depends chiefly on chemistry and austenite grain size. He indicated the effects of these factors on hardenability in a quantitative manner for a wide range of plain carbon steels.

Area Is Average Hardness

Discussing this paper, E. C. Bain and E. S. Davenport, of the United States Steel Corp., said that it might be helpful to point out that in the test mentioned on the 1-inch round the figure designated by the authors as "Area" or "Area Under the Hardness Curve" is really the average hardness across the specimen; indeed, the refinement of assigning only half weight to the surface and center readings, which in their nature dominate half as much of the diameter as other readings, is a device properly employed in making correct averages, they said. The three numbers to be set down in the reporting of the hardenability become then (1) surface hardness, (2) average hardness and (3) center hardness.

Pointing out the proposed rating of hardenability consists of surface hardness, the "area under the hardenability curve" and the center hardness, F. F. Vaughn, Caterpiller Tractor Co., Peoria, Ill., remarked that this method does not indicate the hardness at any point between the surface and the center. He declared that in his experience such information is of importance in the selection of material for certain applications requiring a considerable degree of overall toughness in conjunction with a high degree of hardness for a definite depth below the surface as well as on the surface.

He had also observed, he said, a characteristic of some steels, when quenched and drawn in heavy sections, to show an area of increased hardness at a depth just below the surface, the depth at which the increase occurs varying with different mill heats. It may be desirable to take advantage of this hardness increase for wearing surfaces on parts machined after heat treatment, he observed.

50 times a minute

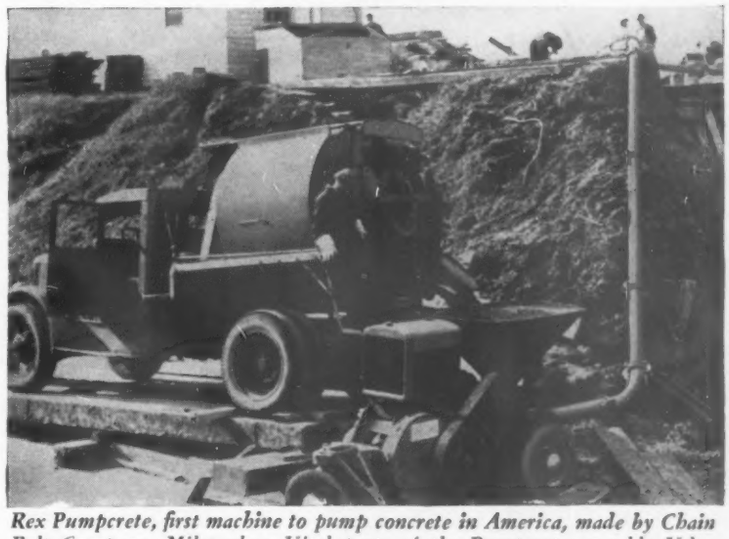
A Slug of Concrete is Forced Through a Vanadium Steel Valve

Of the thousands of applications in which Vanadium Steels are meeting unusual conditions, few installations approach the severity of service to which Vanadium Steel valve plugs and Vanadium Steel valve chambers are subjected in the Rex Pumpcrete.

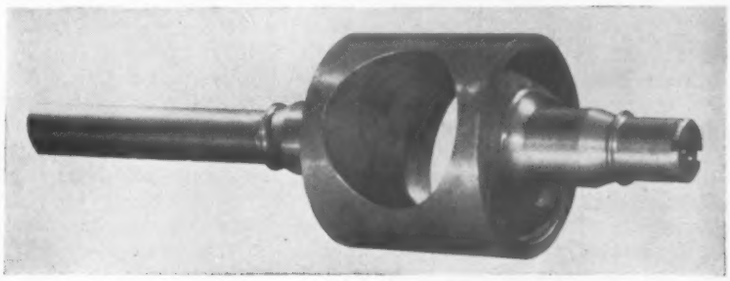
50 times a minute the Vanadium Cast Steel valve of the Rex Pumpcrete opens and closes by a 90 degree turn of the Vanadium Cast Steel valve plug. 50 times a minute a slug of concrete, with its highly abrasive action, is forced through the valve. 25 to 27 tons of concrete go through the valve every hour. Tough service . . . but Vanadium Steel Castings in vital parts have helped Pumpcrete to outstanding records in pumping over four and one-half million yards of concrete.

If you have a tough job for a casting, forging or rolled part, remember the great strength, shock-resisting qualities and dependability of Vanadium Steels. Metallurgists of the Vanadium Corporation of America will be glad to study your problem with you.

VANADIUM CORPORATION OF AMERICA
420 LEXINGTON AVENUE, NEW YORK, N. Y.
Plants at Bridgeville, Pa., and Niagara Falls, N. Y.
Research and Development Laboratories, Bridgeville, Pa.



Rex Pumpcrete, first machine to pump concrete in America, made by Chain Belt Company, Milwaukee. Vital parts of the Pumpcrete, notably Valve Plugs and Valve Chambers, are Vanadium Cast Steel, furnished by Siwyer Steel Castings Company, Milwaukee.



Vanadium Steels

METALS VANCORAM ALLOYS

FERRO ALLOYS
of vanadium, silicon, chromium, and titanium, produced by the Vanadium Corporation of America, are used by steel makers in the production of high-quality steels.

FOR STRENGTH · TOUGHNESS · DURABILITY

New Practices Shown Before Welding Society

FERROUS and nonferrous welding developments were catalogued by the various papers presented before the American Welding Society in its sessions held concurrently with the National Metal Congress and Exposition.

A great and growing variety of low-alloy steels is suitable for welded construction and the welding of such steels is now accepted practice. A. B. Kinzel, chief metallurgist, Union Carbide & Carbon Research Corp., discussing a report by J. H. Critchett, the same corporation, describing the result of a survey conducted among producers of these alloy steels and the users of the same, declared such steels in which carbon is kept below 0.15 per cent and the ultimate strength under 80,000 pounds per square inch may be considered fool-proof. When used in light gage practical welding problems are adequately met. Low-alloy steels having a higher carbon content and an ultimate strength not in excess of 90,000 pounds, as well as lower carbon steels in heavier gages may also be welded satisfactorily provided stress relieving is applied thereafter.

In general application of intelligent welding practice, following the same principles as in the welding of carbon steel, solves the problem of welding. Similar standards and tests as a measure of results may also be applied. Mr. Kinzie takes the view that the welding of low-alloy steels is but a small step beyond the welding of plain carbon steels.

Measuring Toughness

Toughness involves chiefly ductility of the weld under static and dynamic conditions, applying to all portions of the joint, regardless of the narrowness of the welded zone. Hardness as a criterion of ductility properties of this zone is not a sure test, Mr. Kinzel said. One type which may be produced in welding low-alloy steels and which may not have the desired toughness is that zone adjacent to the weld which has been subject to rapid cooling from above the transformation temperature of the steel. The function of the air-hardening properties of the steel may enter this zone, therefore hardness and lack of toughness are not synonymous to the same degree as in plain carbon steels. Attainment of greater strength or hardness without loss of ductility or toughness is the ultimate purpose of alloying structural steels, and Mr. Kinzel urged extra care in determining these issues when fabrication processes call for the welding of low-alloy steels.

The weld joint must be as strong as the base metal, and, assuming toughness is not a great problem within the tensile strength ranges generally used in commercial work, the effect of annealing on welded low-alloy steels is not great as a rule and the possible decrease in strength is of no great importance. Both electric and gas welding rods currently in use fully meet deposited metal requirements.

Sound engineering practice enters in the dependability of the joint. Mr. Kinzel declared qualified welders with previously tested welding rod or electrode known to have good welding characteristics over a wide range of conditions can readily make well-designed joints. From the standpoint of fluidity and slag control, the alloy content of steels in this class is low enough to bring about very few serious welding problems.

Welds Are Uniform

Although many alloy steels are available in only sheets and relatively thin plates, uniformity of welded materials of varying thickness and under many conditions of design is expected and attained. Because of the more selective use of low alloy steels for higher strengths, Mr. Kinzel said the problem of internal stress is more acute and should be given more serious consideration with these steels of a given section than with carbon steels. This, he declared, was a controversial topic, but pointed out that the higher the strength, the lighter the material for a given stress and the less chance for trouble from internal stresses, a major advantage of low-alloy steels offsetting the mild disadvantages entering into the welding procedure.

Strengths of metallic arc welding joints in Monel metal were discussed by F. G. Flocke, International Nickel Co., the result of investigations with J. G. Schoener, that company. In Monel metal up to ¾-inch thickness, a tensile strength of 70,000 pounds minimum is regularly attained welding from all positions. Minimum value of 30 per cent elongation in either jig or free bend in arc welds between this metal is possible, welds being made in any position. Soundness of welds is also shown by X-ray tests of welds from ⅜-inch to 2½-inch thickness. With a Monel electrode, welds between mild steel and Monel are attained satisfactorily by the metallic arc weld process. Break tests in every instance resulted in fractures in the carbon steel plate first, indicating that the alloy weld strength was greater than the tensile strength of the carbon steel. Mr. Flocke stated that when tensile strengths of around 90,000 pounds are required. These are attainable in Monel metal welds when the completed structures are subjected to heat treatment which is possible with a special type of Monel metal containing aluminum to a small degree. Ordinary grades are subject to cold treatment for toughness and strength, but the metal containing aluminum may be cold treated and also heat treated for higher tensile strength. Elimination of greases and other foreign substances at the points adjacent to the weld is also important in welding this metal. These frequently contain sulphur which will not mix with Monel, and, if present, will result in cracking and other defects.

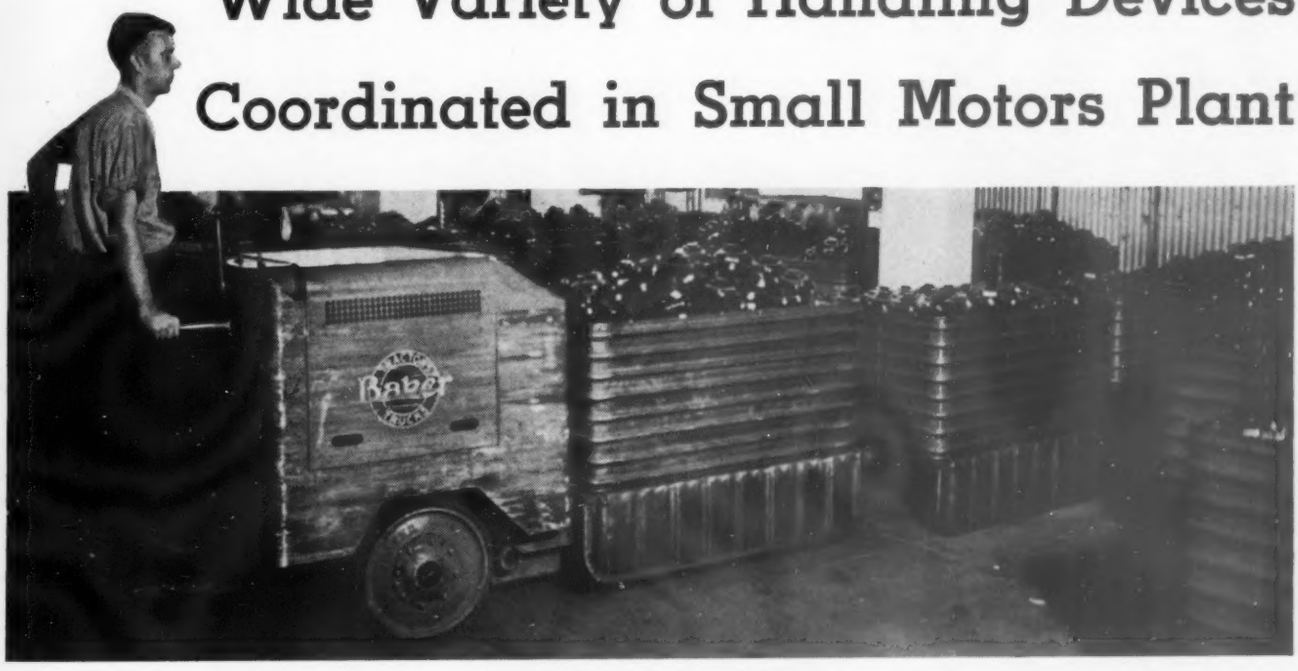
Copper Welding Procedure

Spot welding characteristics of several copper-base alloys were reviewed by D. K. Crampton, director of research, and J. J. Vreeland, metallurgical engineer, Chase Brass & Copper Co., Waterbury, Conn. In common high brass, welding conditions cover considerable range but the required energy input is on the high side. Torsional strength is reasonably high and bursting pressure fairly low. Cartridge brass is somewhat more difficult to weld with less torsion and bursting pressure values. Muntz metal is easily welded with good results with a stronger tendency for this alloy to fail by shear rather than torsion. Low brass requires a low electrode pressure and fairly high energy input and is considerably more difficult to weld. Both agreed that poor results are apparently due to the high electrical conductivity of the material and suggested further research with new types of electrodes. In general the same drawbacks are experienced with red brass in welding.

Addition of manganese to red brass, however, brings marked improvement in welding results. Point sticking and metal "spitting," especially at higher pressures is experienced in welding aluminum brass. With a rather low energy input adequate, silicon brass is weldable over a wide range with little point sticking. Silicon bronze is one of the best welding alloys of the copper-base group with high test values, both torsion and bursting pressure. The same is generally true of phosphor bronze which welds readily under favorable conditions.

MATERIALS HANDLING

Wide Variety of Handling Devices Coordinated in Small Motors Plant



Battery equipped electric industrial truck picking up corrugated steel skid box load of motor brackets which have come through enameling oven and are being taken to various machining operations

FRACTIONAL horsepower and "flea power" motors are items of growing importance in the everyday lives of Americans today. The former provide the motive force which drives countless household utilities such as washing machines, ironers and mixers; the little "fleas" are the vital sparks which run various small devices. A year ago the Westinghouse Electric & Manufacturing Co. acquired the property of the old Relay Motors Corp. plant, Lima, O., and announced it would utilize the plant for the manufacture of small motors.

Immediately work was started to dispose of old plant machinery at auction, to raze all frame buildings on the site and to place the main buildings in first class condition. Interiors were painted, new floors laid and modern lighting and heating systems installed. While this work was underway, plans were progressing on the plant materials handling system. Also, removal of the small motors lines from the East Springfield, Mass. plant was blueprinted so that one line at a time would be moved into the new Lima Works and placed in operation before moving down the next line from Springfield. On Monday, December 28, 1936, the first motor in the first line, a ¼-horsepower unit for a washing machine, was completed, and on that first day a total of 114 motors constituted the day's shipments. From that time on, production facilities were increased and along with them the materials handling system was expanded.

At the turn of the year, the new payroll covered 250 employes. There are now over 1500 Westinghouse employes in Lima, several hundred of them new residents of the city. The plant is located on a site of 21.8 acres of land on the east side of the Dixie highway at the extreme southern city limits. In addition, there are owned by the company 12½ acres, just across the road, and now used for parking space for employes' cars and for an athletic field. The plant buildings contain a total of 400,000 square feet of floor space. They are of cement, brick and steel fireproof construction, with steel casement windows and a plentiful supply of skylights.

As may be imagined in a plant of such size producing a large volume of small motors, efficient and economical materials handling methods and equipment are essential so that there shall be no waste in operations incident to transporting raw materials, and no delays in getting parts and partial assemblies to their successive stations, thus assuring

MATERIALS HANDLING

steadier employment throughout the plant. The Lima works has a very effective handling system. It utilizes tramrail, electric and chain hoists, roller, belt and gravity conveyors, electric and hand-lift trucks, portable elevator, standard and special skids, tote boxes and floor trucks and scales. Each class of equipment has been fitted into a particular class of handling; and while the expansion of the plant will entail some additions and rearrangements, in general the handling system as it now operates will be fundamentally the same after maximum production facilities have been placed in operation.

Incoming materials are principally sheet steel; steel, copper and brass bars; wire and cable; Australian wool for motor wicks; corrugated fibre shipping containers and numerous items of general supplies. These are received in a building housing what is called the plant "feeder section". At the rear end of this is an enclosed switch-track. All storage portions of the "feeder section" are equipped with a tramrail system, which, by means of several advantageously placed switches, and an extension over the switch-tracks, makes it an easy task to unload sheet steel and other heavy stock directly from the freight cars, and to transport and deposit it in its proper storage area.

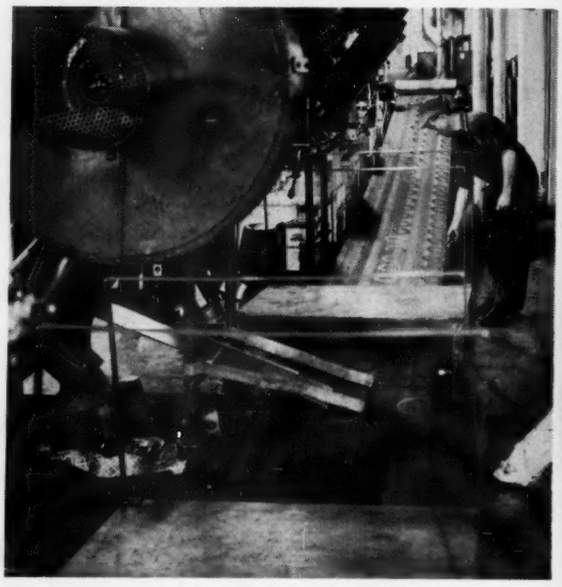
Tramrail system also serves in transporting steel and bar stock to the machines for first operations.

Bars are stored on special racks. The latter were designed by Westinghouse plant engineers, and are made of pipe and angles welded together into sturdy units which hold 10 lots of various lengths of bars.

Essentially the "feeder section" is what its name implies. The only assembly work carried on in it is motor switch assembly, a comparatively minor operation. In all other respects, this section is devoted to preparing motor parts and in turn feeding them into the main assembly departments.

One of the first operations in connection with manufacture of ¼-horsepower washing machine motors entails delivery of a quantity of steel sheets by tramrail to a core plate enameling station.

Stators and rotors are both stamped out of disk-like "cookies" which are handled from presses by belt conveyors. These blanks are stacked on corrugated steel skids with welded rack bodies, which are transported by hand-lift truck to the next operation. There are seven sections on each side of the skid racks, each holding several hundred "cookies". Out of a single sheet of steel, the press stamps out a total of 114 of these disks in units of six at a time.

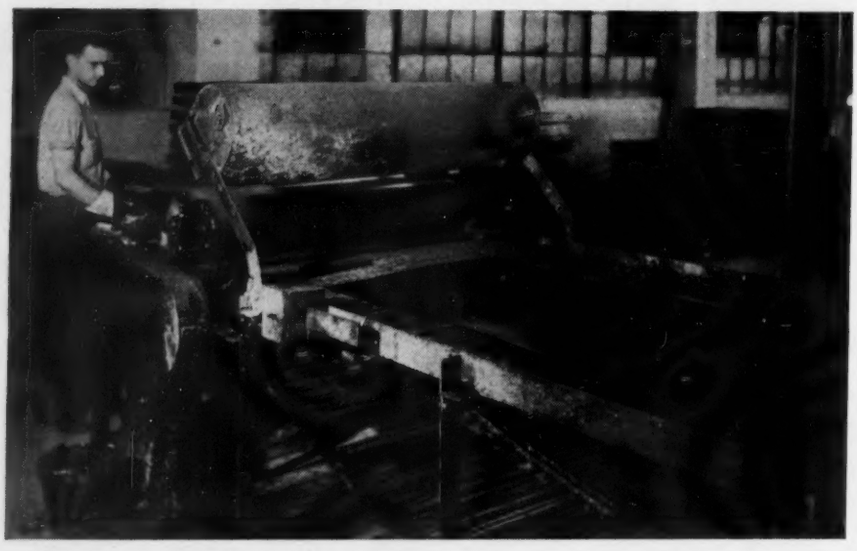


Conveyor belt transporting stator laminations to the stator assembly department

Scrap metal remaining after the blanks are punched from the sheets is pushed into a pit. Here it is baled into units averaging between 300 and 400 pounds apiece. The baler is operated hydraulically and compresses the scrap into a tight bundle, which may be picked up easily by tramrail hoist and carried directly from scrap storage area to freight car.

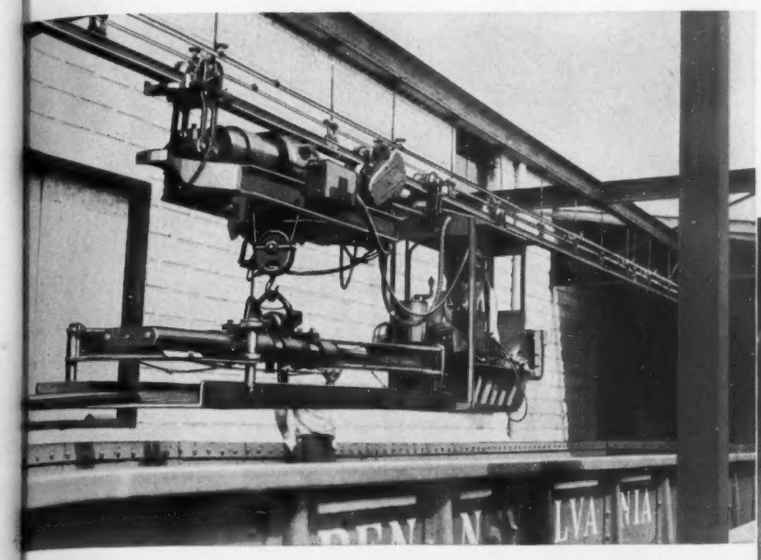
Stator and rotor laminations are stamped in a single operation. A conveyor belt transports the former to the stator assembly department. In this department, sufficient laminations are counted by weighing scales and are then securely locked together by a riveting machine. Rotors are assembled in a similar manner.

Other operations in the "feeder



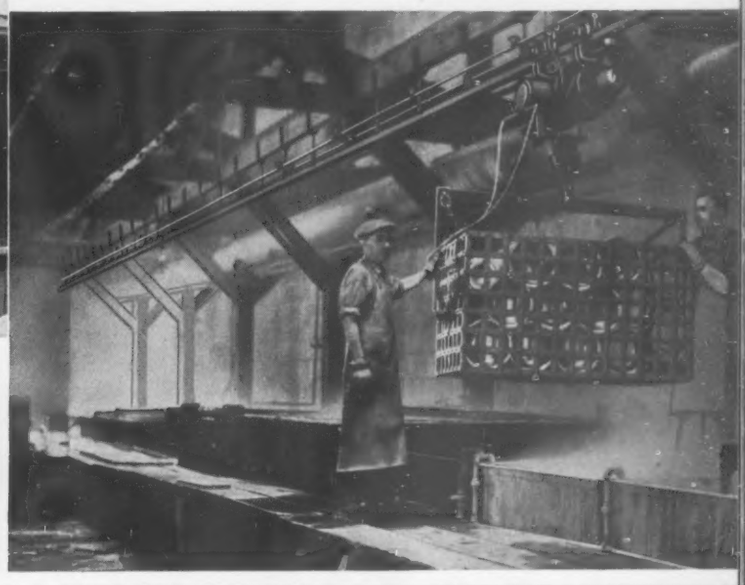
Special chain conveyor handling sheets in the core plate enameling process. Operator has just started a sheet through the oven

CLEVELAND TRAMRAIL MATERIALS HANDLING EQUIPMENT



• Sheet metal from cars to storage — to and through the forming and cleaning processes and to the finishing via

CLEVELAND TRAMRAIL



CLEVELAND TRAMRAIL

Consult your 'phone directory under Cleveland Tramrail'

CLEVELAND ALL WELDED CRANES FOR EVERY INDUSTRY

A STEEL MILL CRANE
15 Ton 120' Span
All Welded

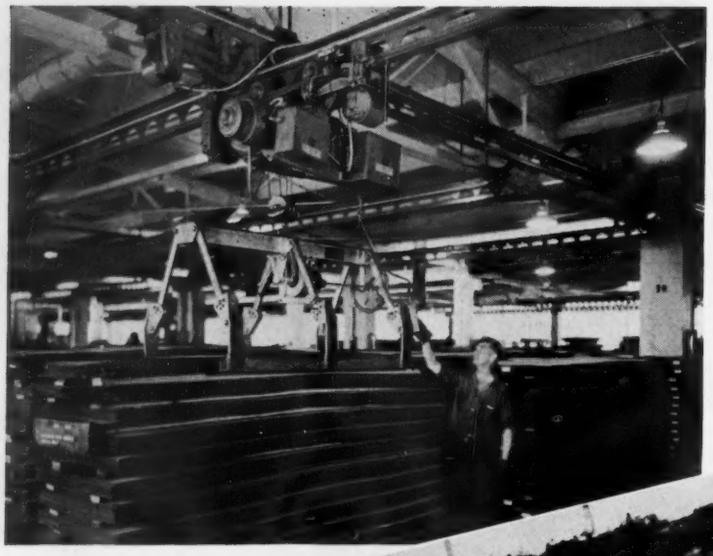
CLEVELAND CRANES

NEW YORK · DETROIT PITTSBURG · CHICAGO

THE CLEVELAND CRANE & ENGINEERING CO.

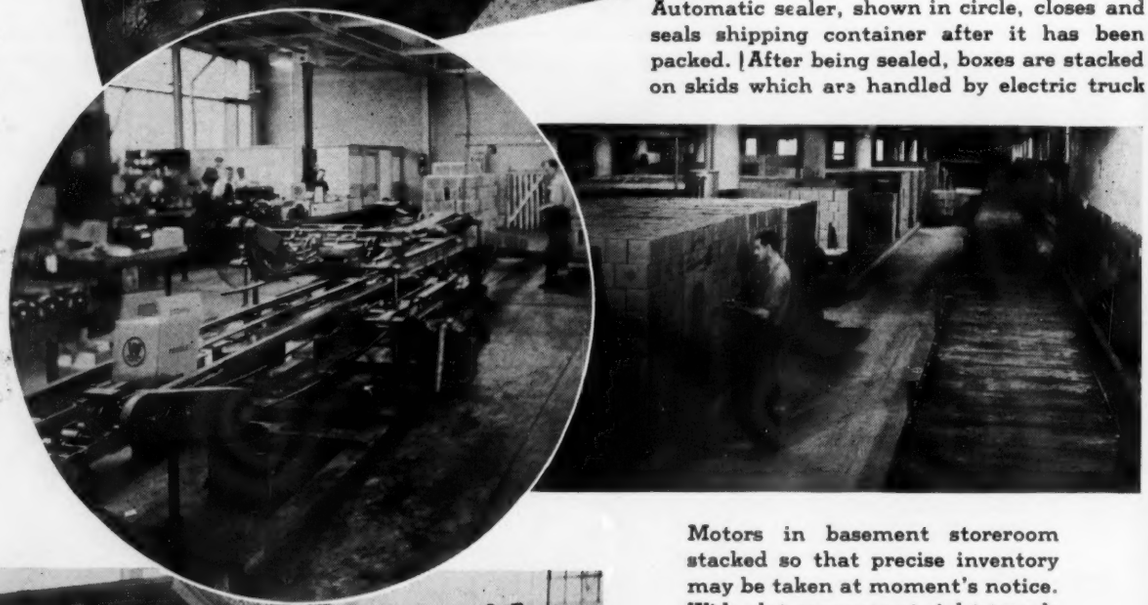
1125 Depot St.

WICKLIFFE OHIO

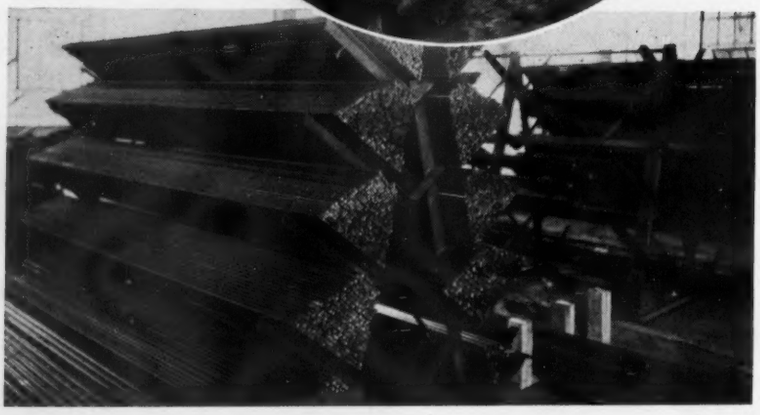


Floor controlled electric hoists equipped with special lifters handle incoming piles of sheet steel from freight cars to storage. They operate over tramrail system covering the entire storage areas and extending out over receiving tracks

Scrap metal from presses is pushed into pit which contains a plunger which, under hydraulic pressure, forms it into bales, averaging from 300 to 400 pounds each. Brass, copper and steel scrap are baled separately

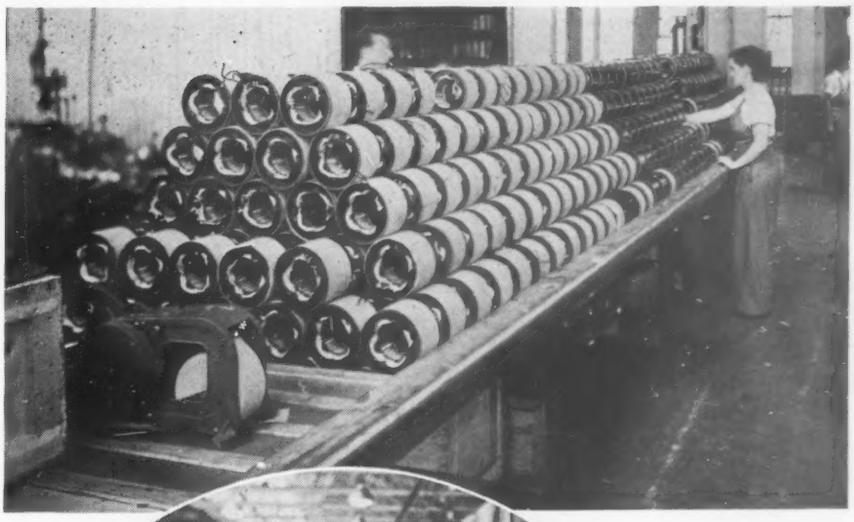


Automatic sealer, shown in circle, closes and seals shipping container after it has been packed. After being sealed, boxes are stacked on skids which are handled by electric truck



Motors in basement storeroom stacked so that precise inventory may be taken at moment's notice. Wide slat conveyor at right travels length of storeroom and out through tunnel to box cars in which shipments are made. Electric truck and skids are used to bring loads to conveyor

Bar stock is handled by tramrail system and is stored in special "A" racks, designed to hold ten lots of various sized bars



After stators have been put through enameling oven, they are wrapped in kraft paper to protect surfaces during subsequent assembly operations

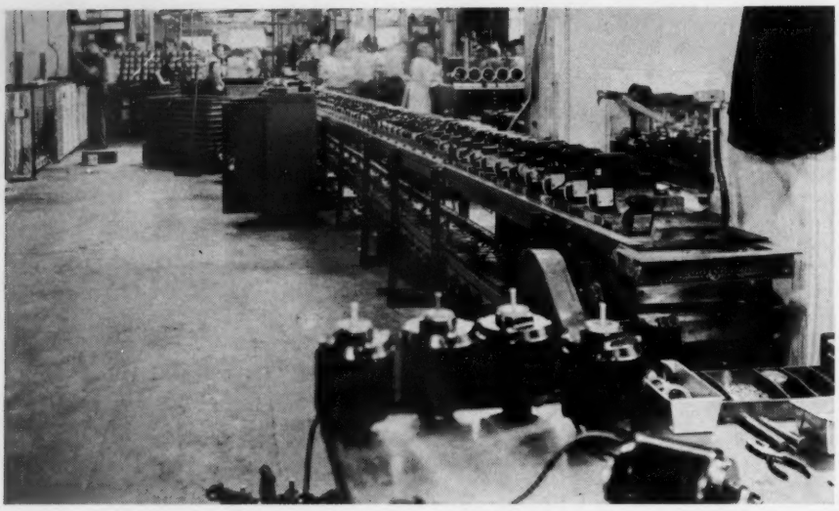
Rubber conveyor belt travels down center of table in stator department where coil windings are assembled in stators

This view of the plant was taken at night. Note well marked aisles and neatly arranged skid loads of laminations

section" include stamping switch parts and rag-paper insulation; motor frames, motor feet and fan blanks. There are presses of various sizes depending upon the particular part to be stamped, at least two of them being 800-ton units, the latter being used for stamping out motor feet. Fan blanks are punched on one press and formed in another machine. They are then piled in corrugated steel skid boxes for transportation by electric truck to assembly operations. A complete die room for the "feeder section" is located conveniently near the presses. A portable elevator is provided for transporting large, heavy dies.

Accessories, such as rivets and screws, are turned out on a battery of automatic machines and placed in metal tote boxes, which are handled to points of use on lift-trucks.

In the main plant building, in addition to offices, cafeteria and recreation rooms and a completely equipped hospital room, are located all assembly departments as well as storage and shipping. Each department is complete in itself. For example, all assembly for ¼-horsepower washing machine motors is separate and distinct from operations incidental to special and miscellaneous small motors. There is no backtracking in the handling system in any of these separate departments. In this connection, it is interesting to note that motor brackets are received from the foundry in finished form ready for shipment and before machining operations have been performed on them. It has been found that this eliminates rehandling, and results in smoother production of finished motors. Ordinary practice in most plants is to perform the necessary machining operations and then send the parts to painting, lacquering or other fin-



Chain conveyor equipped with special fixtures handles assembled washing machine motors to final test

ishing departments to be finished.

Motor coils are wound on automatic winding machines, each with an individual operator. Batteries of these machines are lined up at one side at the head of the main assembly floor.

Stator frames are put through an enameling oven, and then wrapped in kraft paper to protect their outer surfaces from marring during subsequent assembly operations. They are given a coat of black japan varnish and hung from crossbars on a conveyor which takes them into a baking oven. The conveyor will handle approximately 600 units at a time, with one open bar. The oven time is approximately five hours and 10 minutes, and the temperature is maintained at 390 degrees Fahr. Gravity of paint is 830.

Coil windings are assembled in stators by a group of operators seated on both sides of a table, down the center of which runs a rubber belt conveyor on which finished work is carried.

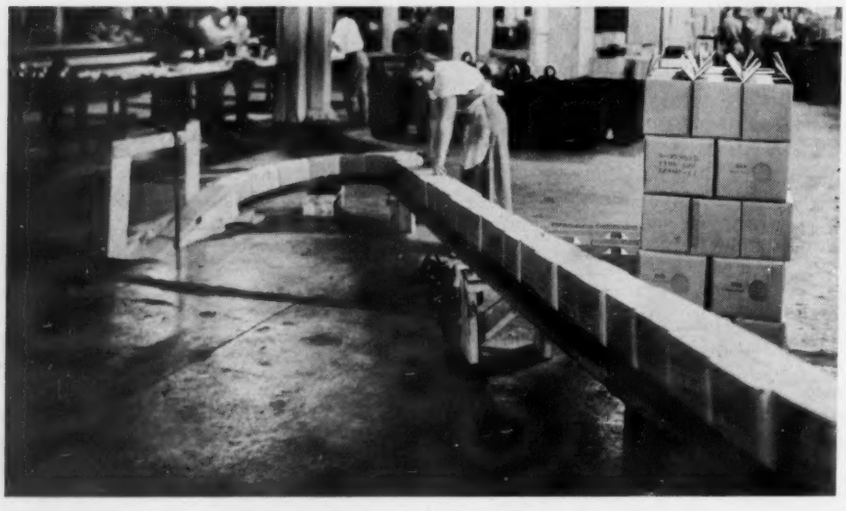
In the meantime, motor shafts are put through various machining operations. They are shaped, then wet ground and knurled and stacked on tote pans for transporting by lift-truck to assembly points.

Battery equipped electric truck and corrugated steel skids are utilized for transporting motor brackets and other such parts to various machining and assembly operations after they have come through enameling ovens.

After coil windings have been assembled in the stators, other assembly operations are performed, including insertion of shafts, switches, rubber mounting, wiring and connectors, and wool wicks. After final assembly has been completed, motors are placed on a chain conveyor equipped with special fixtures. This conveyor handles them to final test stations.

Motors are packed in corrugated fibre boxes, and are conveyed through an automatic sealing machine. At one such sealing station, containers are stacked on corrugated steel skids and the latter are then

Conveyor transports disk like plates, known as "cookies", from press to operator who stacks them on special corrugated steel skid, which takes them by hand-lift truck to next operation



Containers from another section of packing department move over roller conveyor and down gravity chute to basement storage and shipping department

handled through to storage and shipping by electric truck. At another, containers move directly over roller conveyors and down a gravity chute to basement storage.

There is capacity in the basement for storing approximately 100,000 motors. Containers are neatly stocked in areas on a raised wooden floor. A wide slat conveyor runs the entire length of one side of this storage area. Outgoing shipments are collected from various areas by electric truck and skids and brought to the conveyor, which carries them through a short tunnel and directly to freight car doors.

Other materials handling devices are utilized for special purposes wherever required throughout the plant. For example, in the plating department there is a 2-ton chain hoist. Several chain hoists and electric hoists are used wherever em-

(*Please turn to Page 77*)

More than $2,000,000 worth of
MO-MAX
Molybdenum-Tungsten
High Speed Steel
is being consumed this year. The consumers have shifted to MO-MAX for quality and quantity production because they have found it makes better tools. These facts prove that MO-MAX has established itself as a superior high speed steel. Its use in the plants of consumers has demonstrated that—
• MO-MAX requires 8% less weight of steel to make a tool.
• MO-MAX is easy to weld.
• MO-MAX is easy to forge.
• MO-MAX is easy to machine.
• MO-MAX is easy to grind.
• MO-MAX tools are harder.
• MO-MAX tools are tougher.
• MO-MAX tools have superior cutting quality.
Leading steel companies in North America and Europe are now licensed to make MO-MAX. A booklet giving the essential data may be obtained by addressing The Cleveland Twist Drill Company, Cleveland, Ohio.
THE MOLYBDENUM-TUNGSTEN HIGH SPEED STEELS MARKETED UNDER THE GENERAL TRADE NAME MO-MAX
Shift to MO-MAX for Quality and Quantity Production
MO-MAX is a proprietary name owned and controlled by The Cleveland Twist Drill Company and its only licensed use by others is on steel made and sold by licensees under U. S. Patent Nos. 1,937,334; 1,998,953; 1,998,954; 1,998,955; 1,998,956; 1,998,957; and Canadian Patent Nos. 346,506; 364,032 and 364,033.
INDEX OF VOLUME OF SALES
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
1934
1935
1936
1937
SALES OF MO-MAX BY 3 MONTH PERIODS

WELDING, ETC.

BY ROBERT E. KINKEAD

New Welding Processes

THE score of the relatively new welding processes as of August 1937 stands about as follows:

The Union Melt process is moving steadily ahead in fields to which it is applicable. Full automatic and semi-automatic equipment is in successful operation. Speeds of welding are from two to four times any other fusion process on metal ¾-inch thick or more. Ultra conservative handling of the process has avoided blunders and costly failures.

The Longoria process is still a mystery, with hope falling steadily that it will emerge as a process for welding steel. Announced about a year ago, reasonable time has elapsed for commercial application if it can be made to work successfully. In the non-ferrous field it appears to have possibilities but the inventor will apparently have to go into another trance to get over the obstacles encountered in the welding of steel by this method.

Oxy-acetylene welding with slightly carbonizing flame has improved the speed of welding materially. Simultaneously welding from both sides with two blow pipes has increased the net speed of welding and solved several important problems.

Electric arc welding as a process has not had any radical improvements recently. The Una process of feeding tape in with bare wire to accomplish shielding of the arc is commercially successful. In the main, the arc welding machine and electrode manufacturers are spending their time on application of known methods rather than attempting to improve the processes with which they deal. They are asking for it and undoubtedly some inventor will upset their respective apple carts.

High frequency induction welding is being worked on by one of the leaders of welded construction and an announcement may be looked for in the near future.

Sparkless Welding Torch

SPARKLESS welding without scale or disintegration of the metal is claimed for this welding torch recently invented. Secret of the process is a shield of nitrogen around the oxyacetylene flame. The jet of nitrogen is in the form of a circle, surrounding the operation with an inert atmosphere, which is claimed to reduce sparks and scale greatly

IN this column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

♦ ♦ ♦

Fabricators Can Take It

THE steel plate fabricating business is almost completely converted to welding. Bull riveters with their towers and cranes are for the most part silent and unused. The plate fabricators, owners, managers and men, are a tough breed. They have to be.

The era during which the oil companies were building new refineries every year and putting a service station on two out of four corners at street crossings brought too many newcomers into the business.

It was like the wheat farmers moving into the dust bowl; only Frank Roosevelt and God Almighty were busy counting sparrows or something when the plate fabricators' business blew away. Then came the depression. The big customer's work, even when they had any, disappeared overnight. What happened was that the salaried help in the big companies had the fabrication done in their own plants to give themselves jobs to keep from getting laid off. Smart move but poison to the fabricators.

Fabricators who survived learned a lot of tricks, and they learned a good deal more about the business than they ever knew before. They made many jobs in welded steel construction that belonged to the class of work that "couldn't be done." Many of them got into the manufacture of specialties where their hungry brethren could not get at them to cut their throats on the price.

The plate fabricators are coming back strongly, that is, the ones that weather the storms of the last ten years. But these boys are no sissies. They got back because they climbed back under their own power. We would like to introduce some of the dust bowl farmers to them.

These farmers ought to meet some fellows who can take it.

♦ ♦ ♦

Learning Welding

MILWAUKEE School of Engineering has issued a new bulletin describing its courses in welding and including a considerable number of excellent illustrations of welding being done in the Harnischfeger plant in Milwaukee.

Tuition for 180 hours of practical work is $195 and the course may be completed in three months. Like the Cleveland School of Welding, this institution has been operating many years and has a large number of successful graduates.

Throughout the welding industry there is a great deal of appreciation of the work of these independent schools that start at the beginning and teach young men the craft of welding. The engineering colleges are overloaded while a mounting shortage of skilled craftsmen in welding frightens production managers. The free schools maintained by the manufacturers of welding equipment will disappear when enough well-organized trade schools are in operation. Maintained by manufacturers are many valuable apprentice courses by which they educate their own welding operators, but the uncertainties of business being what they are, these courses can seldom produce sufficient men when they are required.

An excellent solution to the problem of getting good welding operators, and one which has been tried out extensively, is for management to pick out promising employes, send them to these independent schools and pay part of the expense.

A New Twist at Ford's

• This is the strange story of a high-speed steel drill with more adventures than Sinbad the Sailor.

Placed on a job at the big Ford Rouge plant in Dearborn, this drill and others like it are used until continued resharpening makes them too short for that work. Then they go to a job that uses them in the same size, but shorter length.

Next the same drills are reworked to a smaller diameter and placed on other jobs — until they are too short for further use there. Then they are worked again, and become center drills for crankshafts or similar parts.

By this time the drills consist mostly of stubs of high-speed steel. Still pieces of fine metal, they go to the electric furnaces, are melted, and become a part of the alloy steel used for Ford V-8 valve-seat inserts. Much the same thing happens to reamers, slotting saws, milling cutters and many other high-speed tools.

This sort of thing is possible in Ford operations because of their great size and scope. To reclaim a dozen drills in this fashion would return less than the cost — but increase the figure to thousands and tens of thousands, and it spells production economy beyond compare.

And production economy spells added value in the product. The Ford Rouge plant is the largest industrial establishment in the world, and the value of its salvage and by-products operations mounts to millions of dollars in a year—just so much saved and used in building the Ford V-8 — THE QUALITY CAR IN THE LOW-PRICE FIELD.

Ford

FORD MOTOR COMPANY

POWER DRIVES

Variable Speed Unit Increases Press Production

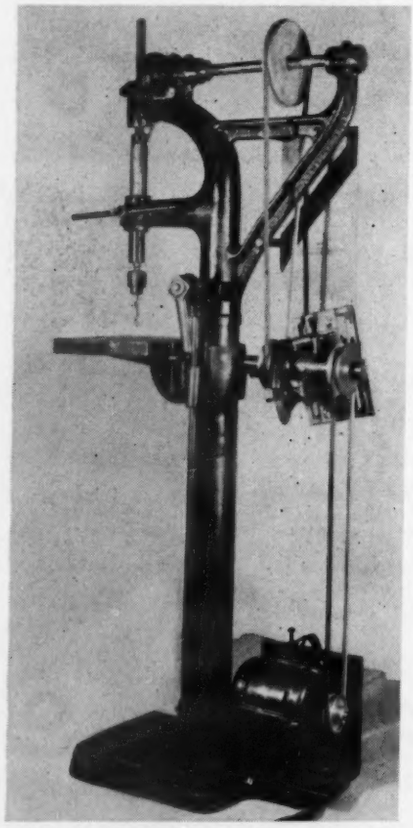
SHOWN driving a drill press in the accompanying illustration is a variable speed transmission, based on an application of the variable-pulley principle.

By a short movement of the hand lever, the operator can set the drill to provide any speed from 250 to 2000 revolutions per minute, thus serving a range of drill sizes from 7/16-inch to No. 60. By enabling the operator to select the most economical and best speed for the drill size and work, increased production of 15 to 25 per cent has been obtained.

On this installation the variable-speed transmission replaced 175 pounds of step-cone pulleys and countershafting and 80 feet of 2-inch belting. It is estimated that the unit will pay for itself within a few months.

The unit consists of two interlocking, variable pulleys mounted on a single shaft. To change the speed, the pulleys and shaft are pivoted laterally by means of the control handle, through a determined arc toward or away from the drive or driven pulleys. As this change is made, the resulting belt tension in the one belt, and the slack in the second, automatically adjust the pulley diameters to give a new ratio between their running diameters. Each pulley is dependent on the other so they are perfectly adjusted in all positions. This mutual compensation relieves all belt strain. The drive is not spring loaded. A light spring is placed in the one hub to compensate for any installation inaccuracies which might be made.

Thrust loads are eliminated by means of the single shaft design. Oversized, sealed ball bearings and a large grease chamber provide for lubrication. Perfect alignment of the belts is maintained in all positions by means of the special base mounting that automatically centers the variable pulleys with the drive and driven pulleys. Standard V-belts are used. The unit is made in sizes from fractional to 7½-horsepower.



Compact JFS-Jr. Vari-Speed control on drill press replaced 175 pounds of cone pulleys and countershafting. Photo courtesy Columbia Vari-Speed Co., Wheaton, Ill.

• • •

Best Motor Speed

GENERAL tendency is toward selecting high-speed, induction motors for all purposes, because of the advantages in lower first cost per rated horsepower and the standardization in frame size and speed.

Many operating troubles, however, may be traced to the use of too high a speed in the driving unit. Resulting excessive maintenance may soon overbalance all first cost or other advantages.

Another factor is that a higher ratio of reduction must be provided with a high-speed motor than with one of lower speed. This reducer, therefore, costs more and must be more carefully machined and balanced for the higher speed.

Plain spur-geared drives, however, usually cause the most operating trouble when direct-connected to high-speed motors. Ordinarily, for spur-geared drives, the best operating speed is considerably lower than for use with herringbone reducer units, silent chain, belt or flexible coupling connection. The use of a flexible coupling in connection with a spur-geared unit helps absorb the gear shock and prevent its transmission to the motor. However, at high speed under continuous heavy load some shock is transmitted back to the motor.

Incidentally, most of the trouble resulting from using a motor of a speed too high for the work shows up in the motor itself. The more common troubles are heating, loose rotor bars, broken connections, sprung shafts, bearing trouble and, in extreme cases, broken frames or end bells.

This emphasizes the need of a thorough investigation of the entire drive and driven unit whenever motor trouble occurs. In many cases the cause of the trouble lies in the driven unit, the connection of the driver to the driven unit (including the base or mounting) or to the improper combination of driving and driven unit. Unless the cause is remedied, simply repairing and going ahead invites a repetition of the trouble at the next weak point.

Best speed for trouble-free operation varies with the size of the motor and type of load. With a heavy continuous load, the use of low-speed motors is usually to be recom-

mended. However, each case should be studied individually.

♦ ♦ ♦

Do Homemade Units Pay?

IN A plant recently visited, the engineer proudly pointed out a homemade variable-speed unit, as he called it, which was used to obtain a variety of speeds for testing and running-in new manufactured units.

This consisted of about a dozen gear trains in pairs, with clutches connecting two pairs so that either pair could be used to drive the next train. By consulting a chart indicating clutches to use, a number of set output speeds could be obtained.

To keep down the cost, jaw clutches were used which necessitated stopping the drive to shift the clutches at the high-speed end of the unit. In an effort to reduce noise, gears were thickly coated with a heavy gear grease.

Somewhat similar homemade units have been seen, using sets of three-step cone pulleys belted together with each set driving the next, where a large number of speeds or extremely low speed is required. Usually one set of cone pulleys is sufficient. Such units also have the objection that, when the belt is changed, the drive stops, thus not giving an even drive under power from one speed to the next.

When the cost of such units is compared with standard types of variable-speed transmissions, it is extremely doubtful if any savings are made in first cost even when junked material is used in the construction. Satisfactory operation is impossible, particularly when smooth increase or decrease in speed is desired or is an advantage. Efficiency, quiet operation and freedom from attention cannot be obtained from such makeshaft units.

Seldom does it pay, either in first cost or in satisfaction, to build homemade devices that could be obtained as standard manufactured products. Even where special machines are required, such work often can be turned over advantageously to shops specializing in such work, especially when the plant isn't set up for machine construction.

♦ ♦ ♦

Shaft Expansion

GENERALLY, in lineshaft installations, the lineal expansion due to temperature changes needs no attention.

Certain types of antifriction bearings, however, have little provision for end shift. On long shaft installation, considering temperature variation extremes of 100 degrees, this would mean a change in length of about ¾-inch.

Naturally the structural steelwork in the building on which the lineshafts are mounted also responds to temperature changes. In addition, the hangers give to permit some lengthwise adjustment. Thus, ordinarily, elongation due to expansion need not be considered.

In a plant where a 200-foot lineshaft was to be installed, to drive a group of special machines covering considerable floor space but not requiring much power, the engineers cut the shaft in two 100-foot lengths to provide for expansion.

Because the machines were synchronized in operation and had to be driven from the same speed source, a motor with an extended shaft and two sprockets was set to drive both shafts. Silent chain reduction was used to the mainshaft with roller-chain drive to the individual machines.

♦ ♦ ♦

Leaking oil is injurious to concrete foundations as well as to windings and insulation.

♦ ♦ ♦

Frequent and thorough inspections are vital in the proper maintenance of all electrical generating equipment, motors and control.

♦ ♦ ♦

A large part of machine depreciation is due to poor maintenance rather than to faulty design or improper operation.

♦ ♦ ♦

Selection of the proper material for gears is important, but the advantages gained by composition may be lost by inaccuracies in cutting or in installation.

♦ ♦ ♦

Improper grooving of a sleeve bearing will wipe the oil off the shaft instead of spreading it, and thus destroy the oil film where most necessary.

♦ ♦ ♦

Proper balance of rotating parts is an absolute necessity in high-speed operation. Even the setscrew and keypad will throw a pulley, gear or sprocket out of balance.

♦ ♦ ♦

Under no circumstances should a machine operator be permitted to adjust electrical controls. Oiling, where bearings permit periodic attention, also is better handled by individuals especially assigned to the task.

♦ ♦ ♦

Installations of electrical control equipment require the consideration of safety, continuity and convenience of operation, ease of construction and provision for quick and easy maintenance or replacement. When all of these factors receive proper attention, practically always the result is also a neat-appearing job.

♦ ♦ ♦

An indication of how a plant grows: a lineshaft drive started out with 25 machines and grew to 67 machines before it got to the point where the motor no longer would carry the load even though overfusing and other dangerous expedients were used.

♦ ♦ ♦

Operating accuracy and reliability of machine tools, at present-day high speeds under heavy roughing or light finishing cuts, would not be possible to maintain without the use of highly-developed antifriction bearings.

♦ ♦ ♦

Gasoline, benzine or carbon tetrachloride may be used to remove oil and dirt deposits from windings. Excess liquid requires more time to dry, may penetrate the windings or affect the insulation, and sometimes washes the deposits into the windings.

♦ ♦ ♦

Never permit spare antifriction bearings to be stored unwrapped or where exposed to dust or dampness, even though protected by the rust-resisting compound provided by the manufacturer. This coating should be removed and the bearing relubricated before application, except where the bearing is lubricated and sealed at the factory.

♦ ♦ ♦

A large tunnel, drying oven had been hand filled and emptied, with the various products remaining in the oven for different lengths of time as required. Changing to a continuous conveyor controlled by a variable-speed transmission, which adjusts the length of time in the oven, has quadrupled production at very little increase of cost over drying the smaller quantity.

♦ ♦ ♦

By graphic meters a careful study of the load on ten motors in one plant indicated some drives were overloaded while others were underloaded. By rearrangement of the load, two motors with a total rating of 75 horsepower were removed and the load redistributed on the remaining eight motors. Lineshafts were realigned to decrease the friction losses. As a result, cost of electrical power was reduced about $1500 per year and power factor was increased 10 per cent with two less motors to maintain. The total cost was slightly under $300 for the rearrangement, or a saving of $1200 the first year and $1500 per year thereafter.

SURFACE TREATMENT AND FINISHING OF METALS

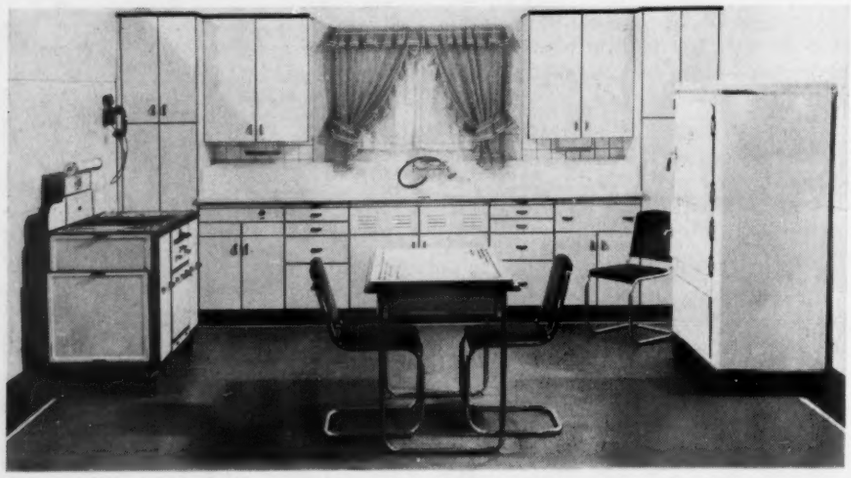
Color Standardization on National Scale Expected to Aid Retailers

MRS. JOHN SMITH'S bathroom is being subjected to a revolutionary advancement which Mrs. John Smith may only come to appreciate fully a year or two hence. And the same goes for Mrs. Smith's kitchen.

One of Mrs. Smith's pet peeves as a consumer, (you would know if you had a chance to analyze her emotions as a shopping tour of retail stores), has for years been the fact that the orchid bath mat she bought for her bathroom never quite looked like the orchid she had at home in her bath towels. Nor has the red in the kitchen teakettle been a fair match for the red on the electric kitchen clock and the enamel on the kitchen table. The various articles in Mrs. Smith's kitchen or bathroom have never looked parts of a unit, but always a mixed picture of variegated shades.

Over a period of years many thousands of customers have fumed up and down the length of a store aisle because they found it impossible to pleasingly "ensemble" their different bath and kitchen accessories. Many thousands of salesclerks have ended a day made unhappy by their inability to satisfy the wishes and needs of their customers. Many a sale has been lost, and more seriously the goodwill of the store has suffered.

Kitchen Entirely in Porcelain Enamel



THIS modern all-porcelain enamel kitchen was one of the displays which the Porcelain Enamel institute sponsored at the National House and Garden exposition in Chicago. Even the walls in this kitchen are porcelain enamel on steel. Of educational nature was another part of the institute's exhibit which portrayed the various steps in applying porcelain enamel to steel products

Consumers Are Dissatisfied

The obvious answer to this source of consumer dissatisfaction is of course color standardization. Standardization of bathroom and kitchen accessory colors would make it possible for the housewife to purchase royal blue salt shakers which would not be perceptibly different in shade from the royal blue of the kitchen range.

Many store merchandisers have long advocated color standardization of this sort. They have pointed out repeatedly that a satisfactory color match was often next to impossible on items made of different materials by different manufacturers. Not only had this inconvenienced purchasers and lost the store sales and goodwill, but frequently has the lack of matching colors been a source of trouble and loss to producers and retailers

from MAINE *to* CALIFORNIA

— and from sardines to orange juice, food of every description is kept safe and salable in Youngstown Tin Plate. When the housewife buys canned foods, their protection is guaranteed by a chain of careful processing — manufacturing — and merchandising. The grocer sells food in cans with a time-proven trust that the grower, the can manufacturer, and the canner has each contributed his utmost in ingenuity to achieve perfection.

Back of that trust is good steel, well tinned and uniformly coated, and finally checked by a most thorough inspection. Steady production results from the uniform working qualities of Youngstown Tin Plate—and consistent food protection follows its continuously maintained standards.

Specify Youngstown Tin Plate and you specify safety and sales.

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon and Alloy Steels

GENERAL OFFICES • YOUNGSTOWN, OHIO

TIN PLATE • SHEETS • PLATES • PIPE AND TUBULAR PRODUCTS • CONDUIT • BARS • RODS • WIRE NAILS • UNIONS • TIE PLATES AND SPIKES

17-1

TIN TRADE MARK YOUNGSTOWN PLATE

YOUNGSTOWN

through slow turnover, multiplicity of stock, excessive returns, and obsolescence. The merchandise manager of a New York store declared publicly in December 1933 that "there is an imperative need for intelligent cooperation among manufacturers of kitchen furnishings to develop a uniformity of colors. At the present time the situation resembles chaos and is burdening the retailer with a totally unnecessary obstacle in his efforts to please the consumer."

Any stable advance or reform comes slowly, however, and it was not until last year that general agreement in the need for color standardization among both retailers and producers had crystallized. At a meeting of housewares buyers in New York, Michael Schaap, president of Bloomingdale Bros., New York, raised the issue anew and urged the buyers to initiate the color standardization project.

The buyers seconded the suggestion with hearty approval and action followed almost immediately. The Merchandising Division of the National Retail Dry Goods Association appointed a color committee under the chairmanship of E. V. Walter, R. H. Macy & Co. Inc., New York, to set the wheels moving.

This committee on April 29th of this year reported its findings to a conference of retailers, manufacturers and interested consumer representatives under the auspices of the national bureau of standards. The committee recommended the adoption of six standard colors for kitchen items and seven for bathroom. Their suggestions were made from exhaustive studies and discussions by store merchandisers and by manufacturers in the preceding months. The conference recognized without hesitation the soundness of the recommendations and enthusiastically, unanimously voted its approval.

The official colors as adopted are as follows:

For Kitchen Accessories

No. SKC—00 White
SKC—15 Green
SKC—30 Ivory
SKC—41 Delphinium Blue
SKC—45 Royal Blue
SKC—70 Red

For Bathroom Accessories

No. SBC—00 White
SBC—11 Green
SBC—20 Orchid
SBC—30 Ivory
SBC—35 Maize
SBC—40 Blue
SBC—45 Royal Blue

One of the prime arguments raised in opposition to the standardization of colors from time to time was that standardization would have the effect of decreasing the number of colors placed on the market by manufacturers. This claim was a particular cause of concern to stores which promote style shades or specify their own colors to the producers. When once the committee's report was brought into the open this obstacle, however, was dissolved. The standardization is recommended only on basic colors, and on the most popular shades of these. The national bureau of standards clearly pointed out that "this commercial standard is not intended to discourage the introduction of new colors, nor to restrict the production of goods in colors other than those selected as standard, and it should be understood that manufacturers are free at all times to introduce other colors and merchants are free to stock colors in addition to those covered by this standard."

Will Be Ready by Spring

January 1, 1938 was the date set by the conference for the merchandise in these colors to be made available generally for retail selling. A great percentage of the affected industries are already working on goods made up in the standard colors, and by next spring there is little question that the housewife, heretofore so frequently frustrated in her desire to obtain harmony of color in kitchen and bath, will find the products in the approved shades available to her in thousands of retail stores throughout the country.

That consumers may become familiar with the significance of standard colors and purchase them with confidence, the national bureau of standards has recommended that articles to match a standard color be identified by a sticker, tag or other label securely attached to the article and carrying the standard color number and approved standards reference of the bureau. This matter is now being worked upon by the housewares merchandising group, merchandising division of the N. R. D. G. A.

The story of the development of standard colors for kitchen and bathroom accessories can hardly be told as a story apart. It is in the larger sense a part of a progressive and revolutionary movement, which under the stimulus of consumer, manufacturing and retail groups, is pervading the fabrication and merchandising of many hundreds of the articles retailed to the public. It is a general trend toward standardization in sizes, descriptive terms, methods of testing and the like, at the urgent demand of consumer organizations.

Standardization to fit the consumer needs was a little considered subject a few years back. Today, it and subjects allied to it, such as "informative selling" and "fiber identification" are of first rank importance of scores of retail stores throughout the country. A few more years may well see development along such lines extending into all manner of industry affecting the consumer, and into every channel of retail distribution.

Sands Steel Surfaces Smooth

THINGS seem to be running smoothly for this workman as he guides an electric sander over the steel roof of a truck cab as it passes through the finishing department of Studebaker Corp., South Bend, Ind.

"The care of a fine precision lathe like this one is a real responsibility," says this plant manager. "That's why we have standardized on Gulfcrest Oil!

"We know that the accuracy of the headstock bearings determines smoothness of cut, the accuracy of the ways determines whether or not a true cylindrical cut can be taken, and the accuracy of the lead screw and of the cross-feed screw determines the accuracy of the screw thread cut.

"We must avoid wear and maintain highest precision. So we asked the Gulf engineer to recommend a high quality oil that would do the job. He recommended Gulfcrest — and we have used it from the start." (Gulfcrest is refined by the same exclusive Gulf process as Gulfpride, the World's Finest Motor Oil.)

Let a Gulf engineer recommend the lubricants which will insure long life and accurate work for *your* costly precision equipment.

GULF OIL CORPORATION GULF INDUSTRIAL LUBRICATION **GULF REFINING COMPANY**

GENERAL OFFICES: GULF BUILDING, PITTSBURGH, PA.

PROGRESS IN STEELMAKING

Drive of New Parallel Continuous Rod Mills Has Unusual Features

A PLANT built to reduce 2 5/16-inch billets to ¼-inch rod, through 19 rolling mill stands, with roll speeds climbing from 8.4 to 1126 revolutions per minute through the train, requires unusual engineering layout and mill drive machinery. These roll speed changes and reductions are being used for large quantity rod and production at an important midwestern rod mill recently completed.

The mill drive machinery, designed and manufactured by Lewis Foundry & Machine Co., subsidiary of Blaw-Knox Co., includes some unusual features.

But one 4500-horsepower motor having 400 revolutions per minute is required to provide the original motive power for the 19-stand train. The 400 revolutions per minute speed of this motor is reduced by the single reduction gears to 158 revolutions per minute. This speed is carried along a spiral bevel gear shaft from which takeoffs run to the finishing stands and thence to the 2500-horsepower double reduction gears shown in Fig. 1. From these gears run two takeoffs. One has speed of 62 revolutions per minute and drives four intermediate roughing stands by means of four 13-inch mill pinions. The other has speed of 18 revolutions per minute and drives five roughing mills through five 15-inch mill pinions as shown in Fig. 2. Spacer sleeve couplings connect the pinion stands to the bevel gear unit.

No. 1 roughing stand receives the billets from the furnace with a roll speed of 8.4 revolutions per minute, which is raised through five stands to 31 revolutions per minute. Four intermediate roughing mills continue the speed increase to 121 revolutions per minute. The rods then pass through a steam operated flying shear, shown in Fig. 3, into the 10 finishing stands. Here five pinion speedup units, each operating two pairs of rolls, increase the speed through these stands from 216 revolutions per minute at the delivery end. The unusual fact that but one motor, used in conjunction with 2 speed reducers, is able to perform this work, permits the use of smaller bevel gears and allows the gear pitch line velocity to be kept low. As a result, noise and vibration are minimized. Furthermore, such an engineering layout permits rapid, easy change of all roll speeds should a change in billet and rod size or production speed be desired. Replacement of a few gears in the double reduction set is all that is necessary.

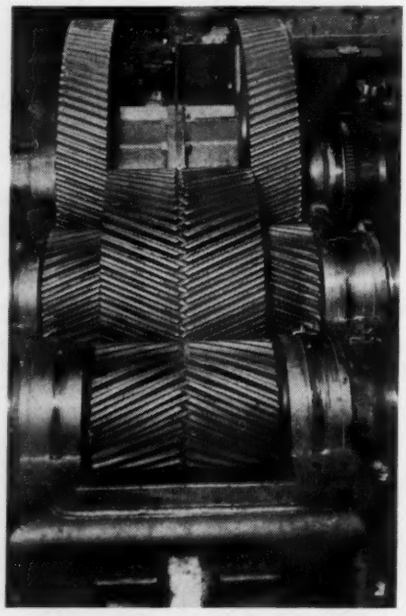


Fig. 1—Double reduction herringbone gears, which provide motive power to five roughing and four intermediate roughing mills

All pinions and gears are of herringbone tooth design and each of the gear and pinion teeth was flame hardened in order to reduce wear. The teeth were heated to hardening temperature by a spray flame and water quenched. Gears are cut from cast alloy steel, pinions from forged alloy steel.

No sacrifice of precision is made for the high speed and the changes in revolutions per minute, since all

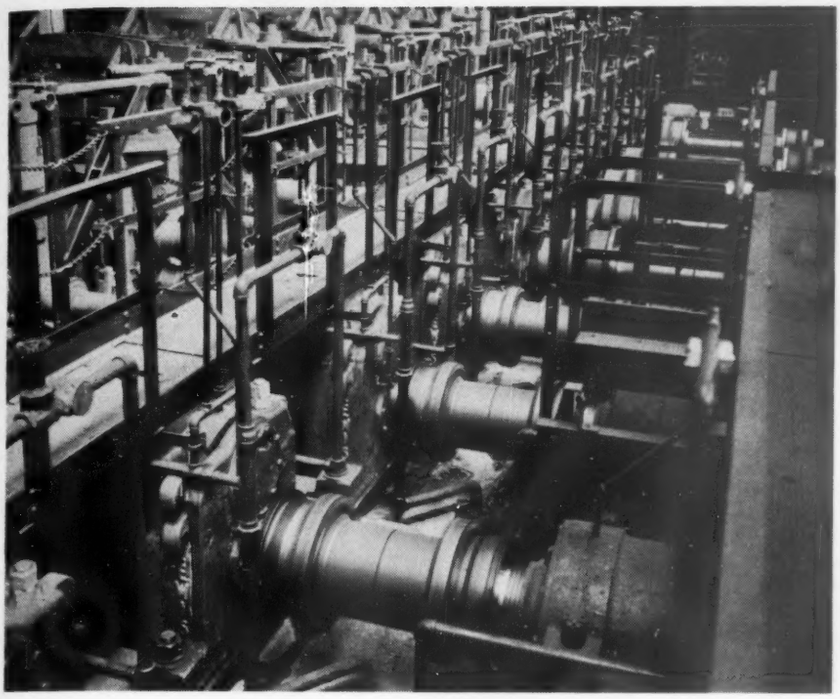


Fig. 2—Roughing and intermediate roughing pinion stands connected to bevel gear shaft by sleeve couplings. Visible oil spray glasses may be seen above walkway

pinion stands are completely equipped with antifriction bearings and all rolls are easily adjusted in any direction. Each gear unit receives a visible oil spray.

An outstanding feature is found in the fact that every individual pinion stand is equipped with a steam radiator for oil heating purposes. These would be used in the event of a winter shutdown which might cause considerable thickening of the pinion lubricating oil. Both reduction gear sets have hot air heaters for the same purpose.

Two parallel mills having identical equipment are in operation in the plant, left and right hand layout being the only difference.

As part of the auxiliary maintenance equipment, the roll shop installed four 18-inch and two 26-inch Lewis roll lathes in order to maintain adequate roll surface precision. These are shown in Fig. 4.

♦ ♦ ♦

Machine Grades Tin Plate

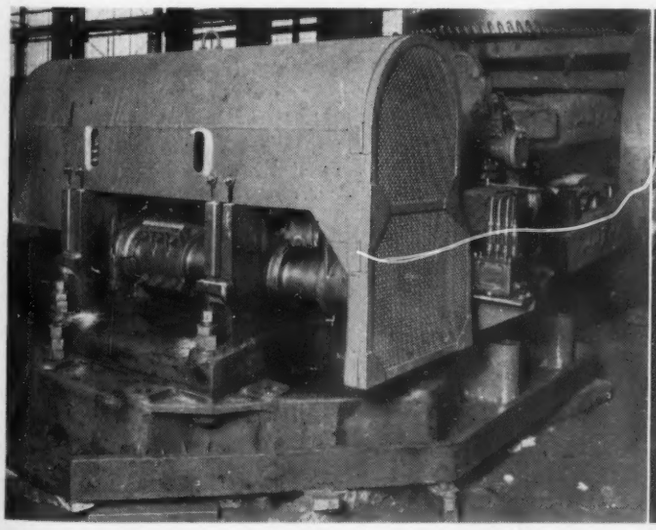
Tin plate now is being graded in England by a machine which automatically feeds, weighs and discharges the plates into three predetermined weight groups according to whether the stock is of correct weight, or of light or heavy weight. All standard sizes of sheets are handled starting with a minimum weight of about 10 ounces up to a maximum weight of 5 pounds by divisions of ¼-ounce. The machine also handles sheets with plus or minus variations from zero up to 10 per cent by divisions of ½ per cent. The predetermined weight is first set and then a selector for the permissible light and heavy tolerances. The machine then will pass into the correct group any sheets within the set range. Plates that are lighter than the present light tolerance are sorted automatically into the light group and heavier sheets into the heavy group. The unit handles sheets up to 20 per minute. The machine is located at the end of the cleaning machine to which is attached the feed control magnet. The latter is linked electrically into the grader circuit, thus insuring a feed of single sheets to the grader.

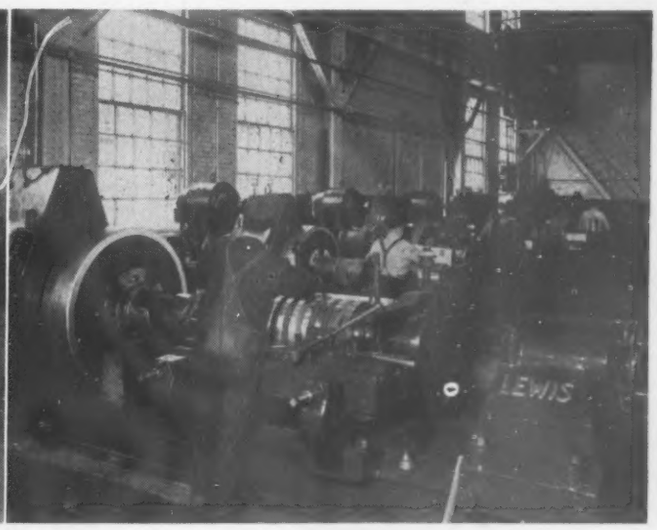
♦ ♦ ♦

Check System Lowers Cost

Dispensing with wire drawing dies is accomplished at a plant in this country in a simple manner by the use of the check method. When a wire drawer makes a requisition on the die room, say for three dies, he gives the window man three checks which are hung on pins representing his wire drawing station. It is impossible for the wire drawer to secure additional dies until he returns the original three dies to the die room and thus redeem his checks. By this arrangement all paper work involved in the handling of dies in and out of stock is eliminated. At one plant having a stock of 5000 dies and where the check method is in operation, inventory disclosed only one missing die at the close of the year. The cost of using this system is low.

Fig. 3 (left)—Passing through this steam operated rod cropping flying shear, the rods go into ten finishing stands. Fig. 4 (right)—Six new roll lathes have been installed as auxiliary maintenance equipment in the roll shop





1937
STEEL
PRODUCTION · PROCESSING · DISTRIBUTION · USE
THE YEARBOOK OF INDUSTRY
THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO
TIMKEN TAPERED ROLLER BEARINGS

The Sand Runs Out

THE YEAR is drawing to a close. The 1937 Yearbook of Industry issue, which has served and is continuing to serve well, will soon have lived its life. But . . . there's a new Yearbook issue coming to replace that which has become worn and dog-eared from much use.

» » The January 3, 1938 Yearbook issue will surpass the old as the old surpassed its predecessors. It will contain all of the time proven features of previous Yearbooks, all of the departments of current issues amplified to fit the occasion; plus much valuable information attuned to the times and future needs. All of this material will be presented in the usual easily accessible manner which makes STEEL'S Yearbook issue of such great value as a reference volume.

» » The 1938 Yearbook issue is a proper medium in which to place your "Master Advertisement" of the year. Your advertisement and your name will be seen time after time. Your product or your service will be continually coming to the attention of your customers and prospects. You will definitely profit by advertising in the January 3, 1938 Yearbook of Industry issue of STEEL.

» » Send in your reservation or write for further details on

STEEL'S 1938 YEARBOOK ISSUE

Porcelain Enamelers Discuss Problems at Second Annual Forum

REPRESENTING all phases of the porcelain enamel industry 230 delegates attended the second Porcelain Enamel institute forum held at Ohio State university, Columbus, O., Oct. 13-15.

J. E. Hansen, Ferro Enamel Corp., Cleveland, opened the technical program with a paper on "Workable Control Systems and Benefits to the Enamel Plants." Mr. Hansen pointed out that with close control and careful supervision of the various enamel shop operations, large important errors occur but seldom, though small errors and mispractices unfortunately can creep in. When an accumulation of small errors occurs, troubles occasionally result which are hard to track down and eliminate.

Mr. Hansen declared that successful enamel plant operation as regards quality of finished product should embrace three basic principles: First, use only materials of known and approved uniformity. Second, determine the most satisfactory methods for each step in the enameling process. Third, develop means to insure control of these methods.

Purchasers Are At Fault

The enameler, it was shown, is often at the mercy of the economics of the purchasing department as regards base metal and other materials used, producing conditions beyond his immediate control. To prevent difficulties from this source specifications for materials used in manufacturing processes should be set up. These specifications should include a detailed outline of the qualities desired in each material, tests which the material should pass and other pertinent data.

Test methods to insure adherence to process or operating specifications were the next point to be taken up. Standard methods of test and analysis were outlined and the weaknesses and advantages of each discussed in detail by the author and from the floor. The discussion which followed this paper brought out the fact that many of the present test methods required too much time to be of value in heavy production shops where interruption of time schedules would entail heavy losses. The need for short accurate tests, it was agreed, is of extreme importance.

The Thursday session was opened by Wade Willey, Nash-Kelvinator Corp., Grand Rapids, Mich., who presented a paper on "Enamel Shop Costs." The subject was discussed purely from the viewpoint of a production shop since job shop problems are largely individual. Enamel shop costs were shown to consist of three main factors, each of which may contain various subdivisions, namely: Quality, quantity and economy.

In his breakdown of these factors Mr. Willey stated that one should always put forth every effort to adopt new methods of processing and testing which will better quality. A high quality standard will reduce scrap, reworks and repairs provided corrections are made from the beginning of processing to the finally approved ware. This necessitates a rigid system of inspection and control at all stages of production and the placing of responsibility for quality directly upon foremen in such a way that workmanship defects will be a direct reflection upon his ability. Pride in workmanship will take care of the matter from then on if the right men are on the job.

Because of the present labor situation considerable interest was aroused when R. M. James, Westinghouse Electric & Mfg. Co., Mansfield, O., presented his paper on "Enamel Shop Incentive Plans." To avoid difficulties with employes, of late, managements have been forced to push incentive plans, efficiency, motion economy and cost reduction more or less into the background.

Before building up an incentive plan in their Mansfield plant, Westinghouse management made a complete study of their manufacturing requirements and then entirely rebuilt and reorganized the plant. Special attention was paid to handling since it was found to account for fully 75 per cent of labor cost. Handling and processing operations were reduced from 63 to 39. Time studies were then made, process groups organized and responsibilities fixed for every operation. Standard time allowances were set for each operation and a system of bonuses and penalties calculated for doing the work within the limit set or losing time.

In the discussion which followed it was brought out that most firms found difficulty in selling the idea of incentive plans to employes until it was proved that the men could make more money. It was agreed that firmness was required to hold rates at an equitable level but at the same time it was not possible to ride roughshod over the men as in the past.

"Safety in the Enamel Plant" was the subject of E. Eckels, General Electric Co., Erie, Pa. Mr. Eckles outlined the system of rules and regulations which every new employe is required to learn and described the schooling of old employes when assigned to new duties. Mechanical guards, safety switches and valves all play a part in assuring maximum safety for employes.

Welding Introduces Difficulties

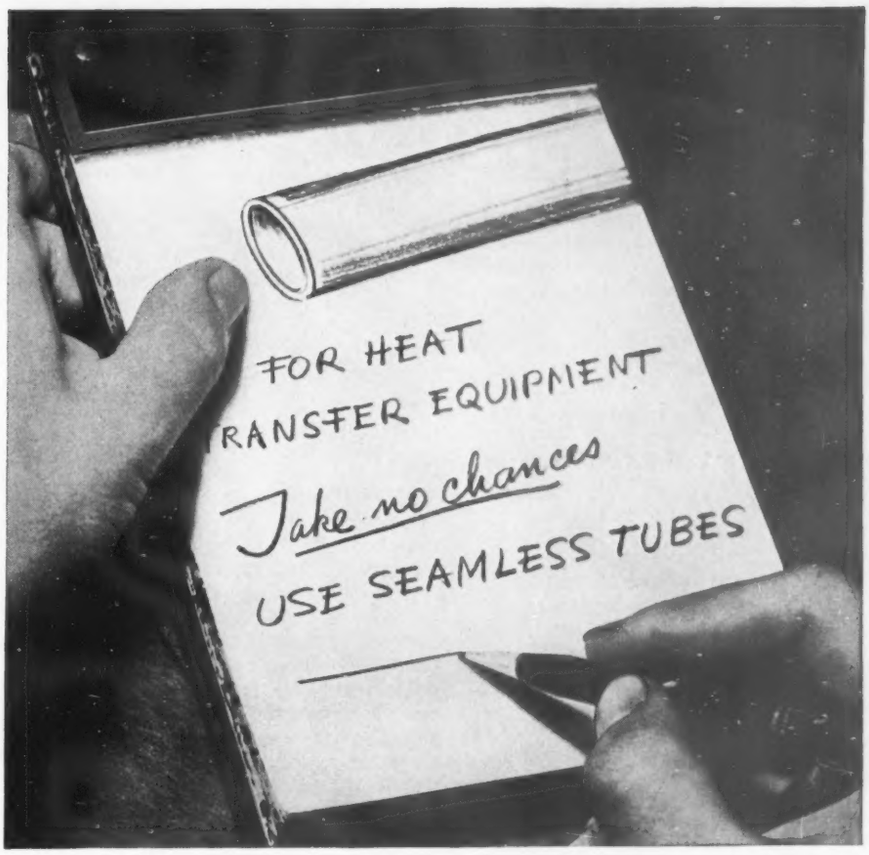
Welding of steel intended for porcelain enamel introduces many special problems as was brought out by Walter W. Petry in his paper on that subject. The first complication is introduced by the fact that lap welding is entirely unsuitable for parts to be enameled. A single uniform thickness must be maintained as far as possible. Welding must be carried out as quickly as possible to prevent heat from spreading and cause warping. Parts to be welded must be cleaned thoroughly from drawing compounds as they will carbonize and form a black edge which can not be cleaned by ordinary methods. This black edge is the cause of many difficulties in subsequent enameling.

Mr. Petry pointed out the precautions which must be observed in each type of welding. When gas welding, it is vital that the flame be completely neutral; excess oxygen in the flame is bad but excess acetylene is worse. Very close control of gas pressures is necessary. Use of coated rods in electric welding is not

(*Please turn to Page* 78)

NATIONAL SEAMLESS HEAT EXCHANGER TUBES

Use them when you want to eliminate frequent replacements



. . . *for Economy!*

WHAT do you call your heat transfer equipment . . . Heat Exchangers? Coolers? Pre-Heaters? Boilers? Evaporators? Economizers? Air-Heaters?

Whatever its name — the equipment designed to transfer heat between gas-and-liquid, liquid-and-liquid, or gas-and-gas cannot be economical in operation if the tubes it contains require frequent replacement. For not only the cost of the tubes but also the cost of labor to replace them and the value of the idle time are involved. For economy, take no chances, use only the highest quality tubes, those that will give long life with the least chance of failure.

NATIONAL Seamless Heat Exchanger Tubes are especially adaptable for the various heat transfer applications. Pierced from the finest quality open-hearth or electric furnace steel, they have no welds, no line of possible weakness. The fact that the steel came through the piercing operation without defect or flaw is ample evidence of its structural uniformity and soundness. Fabrication costs are reduced by final heat treatment which makes these tubes easy to flange, bend, coil, or expand into headers.

NATIONAL Heat Exchanger Tubes are furnished in a number of analyses of steel to meet the differing requirements of modern processes. Our engineers will gladly recommend the best analysis for the particular purpose intended.

NATIONAL Seamless Tubes for Heat Exchangers are available in the following analyses of steel:

1. Low Carbon Steel (Boiler Tube Grade).
2. Low Carbon Copper-Steel (0.20 to 0.35% Copper).
3. 4—6% Chromium, 4—6% Chromium with Molybdenum, and Low Carbon Molybdenum Steels.
4. USS 18-8 (18% Chromium—8% Nickel) Stainless and Heat Resisting Steel.

NATIONAL TUBE COMPANY

PITTSBURGH, PA.

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* : United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

Blast Furnace Men Study Elimination of Fumes

REMOVING particles of fume from blast furnace gases now is being accomplished on an experimental basis, according to a report presented at the fall meeting of the Eastern States Blast Furnace and Coke Oven association and the Blast Furnace and Coke Oven association of the Chicago district, held at the University club, Cleveland, October 15.

About 250 members and guests were in attendance at the session.

In the discussion of primary gas, in the evening, with particular reference to fume removal, it was brought out that an average fume particle is approximately five millionths of an inch in diameter. The removal of fumes is being accomplished in an experimental container but at a high expenditure of power. In the near future the speaker announced, a 9000 cubic foot per minute unit will be in operation.

Field tests disclosed that some flue dust must be present in order to effect a condensation of water vapor and that assists in the reduced removal of the fume.

Precipitation Varies

Tests on the electrical precipitation of flue dust made during the past year have demonstrated, the speaker stated, that both the quantity and the quality of the dust in the gas affect the performance of the precipitator.

In discussing the possibility of fume removal from blast furnace gas he cited the difficulty in wetting the large particles. He suggested that the cooling gas should be cooled, gas brought to room temperature and then washed with water at high temperature thus effecting a condensation of the water on the cooler particles of dust. This method has never been tried, the speaker contended, but the possibility appears promising.

Pyrometers are a valuable asset in prolonging the life of blast furnace lining, according to data collected by a superintendent of a Pennsylvania plant, by placing thermocouples in the lining at the planes of maximum erosion (determined by previous campaigns) about fifteen inches in from the shell affords an indication of how the face of the lining is holding up.

The speaker was of the opinion that in the near future it would be possible to ascertain just how much of the lining is left in the furnace at any particular time.

Data shows that the brick work reaches its maximum operating temperature within a period of five days after the furnace is blown-in From then on the temperature of the in-wall brick is read only once each day.

Any drastic deviation in the temperature reading is remedied immediately either by making a minor change in the filling of raw materials or by changing the height through which the stock drops from the lift of the big bell to the material already in the furnaces.

Discussion brought out the fact that once the stock distribution is satisfactory the use of temperate diameter tuyeres makes little difference in the operation of the furnace.

Another interesting paper that was widely discussed dealt with the possibilities of operating a blast furnace with high internal pressure. One speaker pointed out that if internal pressure is increased in moderate amounts, say from 2 to 8 pounds, the iron oxide will be reduced at a more rapid rate, as shown by tests recently conducted at a German plant. The speaker was of the opinion that any increase in the rate of production would influence the driving of a furnace and hence increase its efficiency.

Another speaker was of the opinion two problems were involved in high internal pressure within a blast furnace. First, would the present furnace equipment withstand the pressure desired; and second, is the theory correct?

Discussion showed present furnace equipment is adequate to meet any conditions imposed by high internal pressure. Throttling effect is much better secured beyond the gas cleaning apparatus than at the top of the furnace on account of the wear.

Following the dinner in the evening, E. C. Barringer, editor of *Daily Metal Trade*, who has recently returned from a European trip, spoke on the industrial and political conditions in England, France, Switzerland, Italy and Germany.

Exposition Highlights

(*Concluded from Page* 21)

Models at the booth of the Bethlehem Steel Co., Bethlehem, Pa., caused spectators to linger and watch the various units operate. Displayed were a bell-type car bottom annealing furnace and a tempering furnace used for annealing material direct from the mill and for drawing material which had been grained-refined in the quenching and normalizing operations and hardened. Next came a car bottom tempering furnace for drawing grain-refined and hardened material and a strain-relief oven for removing hardening strains. Stretching down the table were various models of units for automatically controlling the electric heat treating unit at the Bethlehem plant. Bars leaving the quench tank, passed into a heating furnace composed of high-temperature, intermediate and preheating chambers and finally were brought to rest on a cooling bed.

* * *

Polarized light is said to be one of the outstanding discoveries of recent years which is destined to play an even more important part in the life of the individual, as demonstrated by the Museum of Science and Industry in New York. It also has numerous applications in industry, as indicated by equipment shown by the Bausch & Lomb Optical Co., Rochester, N. Y. For instance, polarized light makes stresses in materials readily visible to the naked eye.

* * *

American Metal Hose division of the American Brass Co., Waterbury, Conn., attracted visitors with an ingenious device which constantly fixed a length of braid-covered copper tubing with spiral corrugations, which is another way of designating steam-tight metal hose.

* * *

Tony Sarg's marionettes played a conspicuous part in the exhibit of the United States Steel Corp., New York, and its subsidiary companies, which occupied the entire stage in the auditorium. In the center of this exhibit, a 39-foot mural showed an electric furnace pouring steel and inset in the lower part of this mural was a small stage on which at regular intervals the marionettes presented a drama featuring alloy steels made by Carnegie-Illinois Steel Corp. At the left of the mural were three small booths featuring respectively a new Heroult electric furnace with gantry top, explosion-impact tests of welded steel drums and wire products. At the right, three more booths featured respectively welding rods, research laboratories and tubular products.

* * *

A new high in the application of zinc base die castings was indicated by the exhibit of the New Jersey Zinc Co., New York. The company's display included numerous machines and die castings used in their construction. One such machine was a Wurlitzer musical record player made largely of zinc die cast parts.

HOT GALVANIZING

IS TO IRON AND STEEL

By its very nature thick and uniquely efficient Hot Dip Galvanizing is impervious to the constant attack of corrosion . . . A product that has been hot galvanized has no weak spots because in this hand dipping process, the molten zinc flows into and fills every crevice, leaving a uniform heavy coating fused fast to the steel core . . . a natural coating of approximately two and one-half ounces of zinc per square foot of surface . . . Patronize members of this Association and know that you are getting the biggest value in rust prevention it is possible to buy . . . Our rigidly enforced standards guarantee perfect workmanship and a genuine hot dip job . . . Write for our booklet . . . Address American Hot Dip Galvanizers Association, Inc., American Bank Building, Pittsburgh, Pa.

IF IT CARRIES THIS SEAL IT'S A JOB WELL DONE

OFFICIAL • INSIGNIA
HOT-DIP GALVANIZING
AMERICAN HOT DIP GALVANIZERS ASSOCIATION INC.

BUY FROM THESE QUALIFIED MEMBERS

Acme Galvanizing, Inc., Milwaukee, Wis.
Acme Steel & Malleable Iron Works Buffalo, N. Y.
American Tinning & Galvanizing Co. Erie, Pa.
Buffalo Galvanizing & Tinning Works, Inc. Buffalo, N. Y.
Diamond Expansion Bolt Company, Inc. Garwood, N. J.
Enterprise Galvanizing Co., Philadelphia, Pa.
The Fanner Mfg. Company, Cleveland, Ohio
John Finn Metal Works, San Francisco, Cal.
Thomas Gregory Galvanizing Works Maspeth, N. Y.
Hanlon-Gregory Galvanizing Company Pittsburgh, Pa.
The Hodell Chain Company, Cleveland, Ohio
Independent Galvanizing Co., Newark, N. J.
International Derrick & Equipment Co. Columbus, Ohio
Joslyn Co. of California, Los Angeles, Cal.
Joslyn Mfg. & Supply Co., Chicago, Ill.
L. O. Koven & Brother, Inc., Jersey City, N. J.
Lehigh Structural Steel Co., Allentown, Pa.
Missouri Rolling Mill Corp., St. Louis, Mo.
The National Telephone Supply Co. Cleveland, Ohio
Penn Galvanizing Co., Philadelphia, Pa.
Riverside Foundry & Galvanizing Co. Kalamazoo, Mich.
San Francisco Galvanizing Works San Francisco, California
The Sanitary Tinning Co., Cleveland, Ohio
Standard Galvanizing Co., Chicago, Ill.
Wilcox, Crittenden & Company, Inc. Middletown, Conn.
The Witt Cornice Co., Cincinnati, Ohio

Labor Costs in the Mills Hold Interest of Wire Men

LABOR cost of 11 man minutes including the foreman's time for cleaning a ton of rods was reported as representative for wire plants in this country at the opening session of the seventh annual meeting of the Wire association held at the Ambassador hotel, Atlantic City, N. J., Oct. 18-21.

This cost figure was mentioned in the initial paper on "New Developments in Material Handling for Wire Mills," by A. F. Anjeskey, sales manager, Cleveland Tramrail division, Cleveland Crane & Engineering Co., Wickliffe, O., to enable operators to check the costs of their cleaning houses which frequently run to 30 man minutes.

Savings in rod handling can be made just as great as those effected in the cleaning house, the speaker declared, depending upon the layout of the plant. He mentioned that an investment of $11,000 is necessary in a wire mill before a single man can be employed. On the other hand the release of a single man in the wire industry for other duties is equivalent to $6000 for new equipment.

One of the advantages of rod handling with the hairpin hook and overhead transportation cited by the speaker is that the load can be weighed after it is picked up. He mentioned that about 50 pounds of 66-degree Baume acid is required to pickle a ton of rods with the proper temperature control. More is required for rods of alloy quality.

Describes New Nozzle

In the author's opinion, wiremakers can have just as neat appearing cleaning houses as a drawing plant if the proper facilities are provided for cleaning the rods. He described a newly developed nozzle which is designed to produce a fan-like spray. By arranging the spray pipes in a vertical position in the tank every square inch of the wire is cleaned.

In discussing pickling tank construction, Mr. Anjeskey advocated the use of the siphon system to avoid leakage. He recommended that the tank be built for two pins of rods as a maximum. This, he pointed out, affords plenty of tanks for various strengths of acid and facilitates dumping with a minimum of disturbance. He cautioned that a sump should be provided.

R. Neuhaus, president, Nukem Products Corp., Buffalo, in commenting on rod cleaning systems, stated that the acid installation is just as important as the handling of wire. With the drain of a pickling tank accessible both inside and outside there is little trouble that cannot be overcome, he contended. There are many wooden tanks that have been in service for 15 years or more, he explained, and many rubber-lined steel brick tanks whose life has not as yet been determined even though they have a service of more than three years.

H. E. Klein, engineer, chemical industry, B. F. Goodrich Co., Akron, O., brought out the fact that rubber-lined tanks after one year service show a low cost based on the acid consumption.

Agree on Maximum

While predominating weight of coils in present-day practice is about 600 pounds the consensus of opinion is that rod bundles weighing 4500 pounds would not be exceeded for many years.

In discussing "Alternating-Current Electropickling" at the opening session Tuesday, A. B. Dove, chemical engineer, Canada works, Steel Co. of Canada Inc., Hamilton, Ont., cited data from recent tests to show that there is a marked improvement in the finish of all rods pickled electrically. In spite of the thiourea base inhibitor, he stated, electrically pickled work can be readily copper coated for drawing purposes. This, he explained, is in direct contravention to the general practice; normally the presence of inhibitors in the pickling solution will prevent uniform copper coating of steel wire or rods.

The speaker pointed out that the results found in the use of the electrical process are obtained by virtue of organic and inorganic chemical reactions catalyzed by 25-cycle alternating-current. The organic reactions, he said, are those involving gluconic acid, iron oxides and iron sulphates. By these reactions ferrous iron is removed from the pickling solution, in effect oxidation of ferrous to ferric iron is assisted and sulphuric acid is regenerated. The noticeable result, he contended, is that of longer active tub life, low acid consumption and rapid pickling action.

Mr. Dove presented graphs and tabular data to illustrate that in speed, pickling efficiency, low-iron losses, and cost, the electrical alternating-current method is of definite advantage.

Although some hydrated lime is employed in wire drawing, the major tonnage by far consists of high-calcium quicklime, according to the observations of D. E. Washburn, chief chemist, American Lime & Stone Co., Bellefonte, Pa. He spoke on "Lime in the Wire Industry" and by means of samples showed the characteristics of several grades of lime. The physical properties of the lime, and to some extent, its chemical properties, are influenced by the length of time it has been subjected to high temperatures, he explained.

Mr. Washburn emphasized that the porosity and degree of burning play an important part in determining the economic value of lime used in wire drawing, and that the time-temperature modifies the porosity.

Discussion brought out the fact that some wiremakers prefer hydrated lime for coating the product because it is easy to handle. Twice the amount is required, however. The author warned that the magnesia content of the high-calcium should not be under 1 per cent nor over 2 per cent. If the maximum percentage is exceeded the product will lack adhesiveness.

Suggests Lime Coating

B. L. McCarthy, chief metallurgist, Wickwire Spencer Steel Co., Buffalo, pointed out that a fluffy lime coat on the wire as it leaves the baker is desirable in that it affords the best vehicle for preventing the breaking down of the soap lubricant during the drawing operation.

In answering a question of a member as to whether there is at the present time any method for determining the amount of lime in the lime tub, Mr. Washburn stated that a sample from the tub is mixed with a small quantity of cane sugar and allowed to stand for 30 minutes. The solution then is titrated with hydrochloric acid to the first disappearance of color and the end point read.

Construction and installation of rubber lined pipe and troughs were described by H. E. Klein, B. F. Goodrich Co., Akron, O. Discussion of this paper by the chairman of the session, S. A. Braley, Mellon Institute of Industrial Research, Pittsburgh, brought out the announcement that after Jan. 1, 1938 no industrial plate plant in Pennsylvania will be permitted to dispose of its spent acid in rivers. The session was brought to a close by the showing of a motion picture on "The Making of Steel Wire," taken at the plants of the Bethlehem Steel Co.

NEW EQUIPMENT

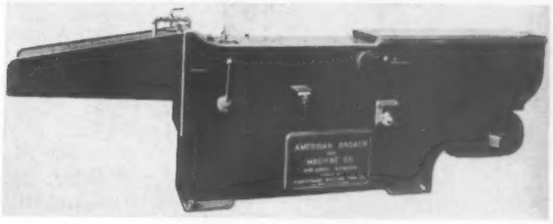
Spot Welder—

Eisler Engineering Co., 750 South Thirteenth street, Newark, N. J., has announced the No. 235-SLO electric spot welder designed for welding materials that are veneered, lacquered, painted or coated on one side—method known as overhead welding. Both electrodes come in contact with the metal on one side only and it is claimed welding is accomplished without burning or blistering the finished surface opposite. The new machine is of 125 kilovolt-ampere capacity, but is made in many sizes depending on the material to be welded. It is air-operated with all controls, including automatic timer, completely enclosed, and is easily operated by means of a foot-operated switch and solenoid-controlled air valve. Transformer is air-cooled and has 24 points of current regulation. Table with rollers is provided to handle large sheets of metal with ease.

♦ ♦ ♦

Hydraulic Broaching Machine—

American Broach & Machine Co. division, Sundstrand Machine Tool Co., Ann Arbor, Mich., has announced the type H horizontal, hydraulic broaching machine built in five sizes for handling any internal broaching operation and a variety of surface-broaching operations. Heavy box-section bed, well ribbed throughout, provides rigid support for all machine members and contains large separate reservoirs for hydraulic oil and coolant. Standard frame motor is directly connected to hydraulic unit by flexible coupling supplied. Motor is protected against entry of dirt and chips and is mounted off the floor at rear of machine. Pumping unit is continuously submerged in hydraulic oil contained in reservoir in bed. Infinite variation of cutting speed is provided by conveniently placed lever with graduated dial, and fan-type pressure gage enables operator to check pressure in hydraulic system quickly. Hydraulic cylinder is solidly secured to bed under pulling slide, conserving floor space. The extra long, large pulling slide is said to promote smooth cutting, continuously maintained alignment and long life. The hardened steel ways ground and located provide a durable mounting for the slide.

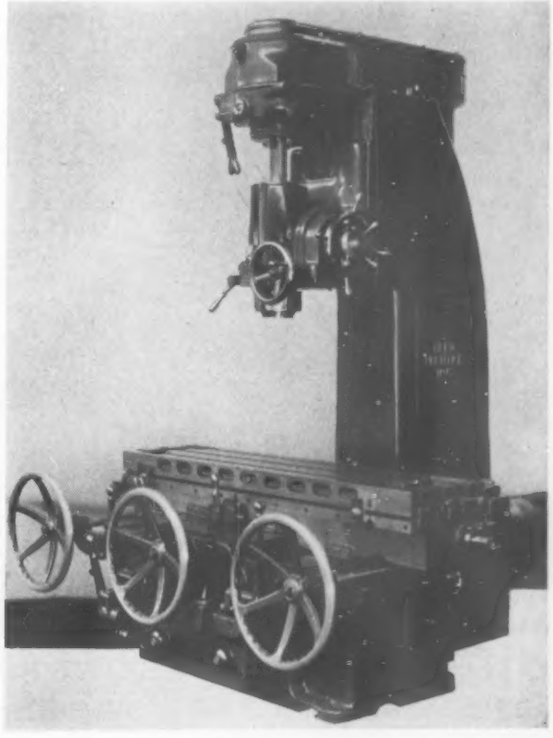


American broaching machine is built in five sizes for any internal and many surface - broaching operations

♦ ♦ ♦

Vertical Miller—

Reed-Prentice Corp., Worcester, Mass., has announced the new model No. 5 vertical miller and die sinker with helical gear drive to spindle. Entire top gear box of the machine is equipped with helical gears mounted on Timken bearings. Throat depth is 20 inches and rapid power traverse either cross or longitudinal is 100 feet per minute. Taper hole is standard 3½-inch taper per foot with No. 10 Brown & Sharpe adapter. There are eighteen spindle speeds, in the standard range from 17 to 600 revolutions per minute, and in the high speed range from 34 to 1200 revolutions per minute.



Model No. 5 Reed-Prentice vertical miller and die sinker is equipped with helical gear drive to spindle

Standard equipment includes single pulley drive, rapid power traverse, spindle adapter, spindle drive belt and wrenches.

♦ ♦ ♦

Steel Desks—

Globe-Wernicke Co., Norwood, Cincinnati, has made new additions to its line of Advance steel desks

This model is one of new additions to the line of Advance steel desks

which include the model illustrated, a unit substantially made of steel with Duro-Velv finish and hard tempered Masonite top. It has four legs and full side and back panels. Pedestal at right contains a large storage or filing drawer with two small box drawers in left pedestal. Wide center drawer is fitted with convenience tray for small accessories.

♦ ♦ ♦

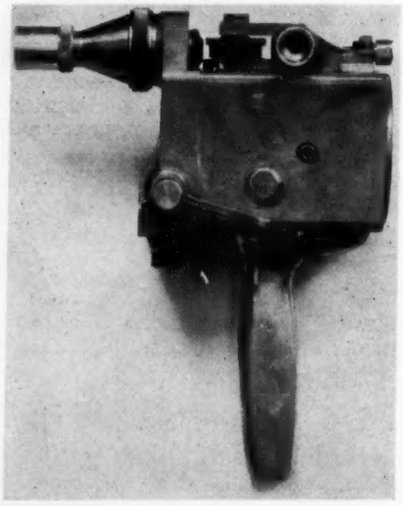
Moineau Pump—

Robbins & Myers Inc., Springfield, O., have announced, under exclusive United States license, production of the Moineau pump. This unit is claimed to have the advantages of a piston-type pump in that it is self-priming and will operate under high head pressures, and also many advantages of centrifugal and rotary type pumps, such as uniformity of flow, minimum turbulence of liquid, and other characteristics. The Moineau pump is a valveless, positive displacement pump with a single rotating assembly. The rotor rolls in the stator helix, maintaining a sealed surface contact throughout its length, its eccentric rolling motion effecting an advancing positive displacement from one end of the stator to the other. Theoretical volume of displacement is equal to the product of the difference in cross sectional areas of the stator and rotor, pitch length of the helix, and the revolutions per minute of rotation.

♦ ♦ ♦

Metal Sprayer——

Metals Coating Co. of America, 495 North Third street, Philadelphia, recently has developed the Majestic Metalayer for speedy depositing of metal, with less oxygen and acetylene consumptions per weight of metal deposited in larger size wires. It is claimed that, with efficient design of turbine, a small increase only in the pressure and volume of compressed air is required over tools of lower capacity. The train of gearing from the turbine to the final feed roll consists of two hardened worms, one bronze and one fibre gear, respectively, of special composition, and the entire gear assembly is enclosed in one compartment containing grease. Feed rolls are conveniently engaged by an adjustable latch bolt operated with a single motion, facilitating speedy engagement, sensitive control and quick release. The gun can be lit and flames adjusted with or without the wire feeding, thus eliminating waste of wire during adjustment.

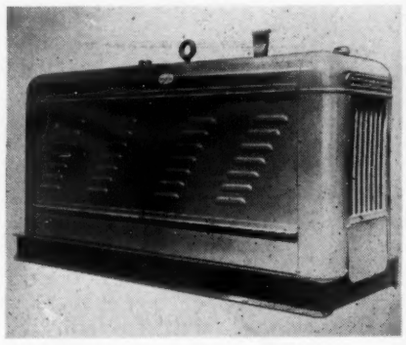


Majestic Metalayer without cover shows simple feed rolls

♦ ♦ ♦

Pipe Line Welder—

Wilson Welder & Metals Co., 60 East Forty-second street, New York, has designed a new electric welding machine exclusively for pipe line work. Obtainable in 300 and 400 amperage capacities, this Yellow Jacket machine is ruggedly built, weather contingencies, field operating circumstances and other conditions peculiar to pipe line welding having been considered in the design. New features include double sediment collectors for carburetor supply, improved foolproof idling device, thirty-six gallon gasoline tank, and improved current switch. Other features include close coupled design, lowered center of gravity of one foot, light-weight reinforced framework and base, center lifting bail, and double-radiator protecting grill. Distributor and other parts are easily accessible and for operating purposes two hinged panels are placed on each side, thereby permitting access to all controls.

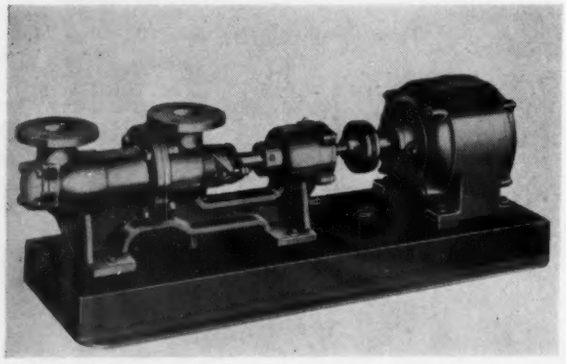


Wilson Yellow Jacket welder was designed exclusively for pipe line work

♦ ♦ ♦

Test Indicators—

Federal Products Corp., 1144 Eddy street, Providence, R. I., has announced the model 2 universal test type indicator, graduated in 0.001-inch and with a range of 0.030-inch. This same type instrument is furnished in metric graduations, model 3 being graduated in 0.005 millimeters with a total range of 0.2 millimeters and model 4 being graduated in 0.01-millimeters with a total range of 0.8-millimeters. Swivel contact point and universal holding bar on the instruments allow setting in any desired position. Motion of point is reversible by shifting lever. Point is interchangeable and instruments have jewel bearings and hair spring case.



Moineau pump is now licensed for manufacture by Robbins & Myers Inc.

MATERIALS HANDLING

Variety of Devices Handle Materials in Motor Plant

(*Concluded from Page* 54)

ployes may be aided in heavy lifting operations. A portable crane with 2-ton hoist is a handy unit for spotting machines or moving them from place to place. Protection to operators is provided by safety devices at every point where there is any possible hazard for employes or visitors.

Eventually, it is expected that the plant will produce each day a total of 5,000 motors. When this point is reached, the materials handling system as now installed may be changed slightly, but it appears to be set up at present to function effectively even at higher production schedules.

More Warehouse Capacity With Pallet Storage

ORIGINAL plans providing for pallet piling in one plant called for piling two tiers high, therefore, standard tiering trucks were purchased. These units lacked 4 inches of piling three tiers high, and the load was too heavy to permit tiering two pallet loads at a time. Purchase of a new tiering mechanism for one of the two trucks permitted adding 50 per cent to the storage capacity of the warehouse at little extra expense.

Stainless Steel Plaques Affixed to Prize Bridges

TO TWO of the three "most beautiful bridges" erected in 1936 were affixed stainless steel plaques recently by the American Institute of Steel Construction. They were the East river crossing, of the Triborough bridge, New York, winner in the monumental size group in the institute's annual contest, and the Astoria boulevard bridge, Grand Central parkway extension, New York, winner in the small span class.

Plaques were presented by Clyde G. Conley, institute president, and were accepted by Robert Moses, chairman, Triborough bridge authority, and president, Long Island state park commission.

The East river crossing span was fabricated by the Bethlehem Steel Co., American Bridge Co., and American Locomotive Co. Astoria boulevard bridge was fabricated by the American Bridge Co. Third winner in the contest was the Hurricane Deck bridge over Lake of the Ozarks, Missouri. For photographs see STEEL, July 5, p. 34.

Scale Identifies Steel And Records Weights

TWO unusual recording scales are in use in connection with the 100-inch semicontinuous plate mill at the Homestead plant of the Carnegie-Illinois Steel Co. Each scale has 110 types of identification signs. Once set, the identification device automatically identifies each load. When it is desired to obtain subtotals, for example, of a number of loads with same identification, the scale automatically records the figures. Each scale has a 20-inch dial, but its only purpose is to indicate that the weighing mechanism is operating. This identifying and totaling mechanism was reported in a recent issue of the *U S Steel News* to have speeded up the weighing job and attained a higher degree of accuracy.

Reinforcing Wire on Pallet

IN A New Jersey plant, where large quantities of home-made wooden pallets are used in connection with materials handling, considerable difficulty had been experienced with platforms. Too often boards became loose from sudden jarring as lift-truck forks took the load. More frequently, nails became loosened and resulted in much scratching and marring of the surfaces of finely finished cases, a feature of the commodity handled. The solution was to cut a groove all the way around the top of each pallet platform, and into this groove nail a No. 10 steel wire directly over the nail-heads of the platform. Since this grooved reinforcement has been used, the former difficulties have been eliminated entirely.

Trucks Do Special Duty

A MANUFACTURING plant without crane service utilizes its industrial trucks to perform work which in most shops would be handled by a crane. For example, when a forging press must be taken down and sent out to have the slides machined, the side pieces are loaded on two 5-ton electric trucks and carried to the flat car on which they are shipped to the machine shop.

RECENT PUBLICATIONS OF MANUFACTURERS

Copies of any of the literature listed below may be obtained by writing directly to the companies involved, or by addressing STEEL, in care of Readers' Service Department, 1213 West Third Street, Cleveland

Arc Welding—Hobart Brothers, Troy, O., has issued a folder on "Building Your Own" simplified arc welder at a substantial saving.

Spray Equipment — Binks Mfg. Co., 3114 Carroll avenue, Chicago, has issued a 60-page catalog on its complete line of spray painting equipment.

Refractories—Cleveland Quarries Co., Cleveland, is distributing bulletin 15-A dealing with the quarrying of stone for refractory use in steel plants.

Blowers and Ventilators — Allen Corp. 9751 Erwin avenue, Detroit, has issued a circular dealing with the Allen air circulator and one dealing with Multi-Vane turbine ventilators.

Gang Slitting Machines—Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., has issued bulletin No. 898-S illustrating and describing its complete line of gang slitting machines.

Air Controls—C. B. Hunt & Son's Co., Salem, O., has issued a complete new catalog covering revisions and additions to its air control line and a section on its new line of hydraulic valves.

Cables — General Cable Corp., 420 Lexington avenue, New York, has issued a booklet on Trenchlay and Ruralay, concentric-type cables for direct earth installation on single-phase systems.

Copper and Brass — Revere Copper & Brass Inc., 230 Park avenue, New York, has published a large broadside for its distributors and dealing with Revere's campaign of fall advertising to building interests.

Over-Running Clutches — Hilliard Corp., 102 West Fourth street, Elmira, N. Y., has issued a new bulletin on the Hilliard Over-Running Clutch and describing its basic applications.

Industrial Tires—B. F. Goodrich Co., Akron, O., has issued an industrial tire handbook dealing with the use of proper rubber-tired wheels on material handling equipment to reduce abrasion, impact and waste.

Insulations, Roofs — Johns-Manville, 22 East 40th street, New York, is distributing a 64-page illustrated book on insulations, built-up roofs, corrugated Transite, industrial friction materials, electrical materials, pipe, stacks, packings and gaskets.

Oil Filtration — Briggs Clarifier Co., 3262 K street, N. W., Washington has published an oil filtration manual on internal combustion engines entitled "When Is Oil in Good Condition?", a summary of modern methods of filtering crank case oil.

Porcelain Enamelers Hold Second Annual Forum

(*Concluded from Page* 70)

suitable because metal is left in a condition which renders it impervious to pickling acid. Only if welds can be subsequently ground is the use of coated rods permissible. Resistance welding has been found very satisfactory but many features must be watched closely. One difficulty, not generally detected, is found in spot welding which must be timed so that melted region does not reach the surface of the metal or troubles will be experienced in enameling.

The subject of "Drawing and Cleaning Compounds" was covered by D. J. Benoliel, Quaker Chemical Products Corp., Conshohocken, Pa. In opening his discussion Mr. Benoliel stated that the best way to get work clean was not to get it dirty. In other words, choice of drawing lubricants and cleaning compounds should be made so that thorough cleaning can be obtained with the least difficulty. When simple soaps are used to lubricate drawing operations the matter of cleaning is simple. However, as drawing becomes more difficult and other compounds must be used the problem of cleaning becomes more difficult.

James Pettyjohn, Mullin Mfg. Co., Salem, O., presented a paper entitled "Nickel Dip Treatment of Enameling Iron," in which he discussed the theory of nickel dipping, control of solutions and various advantages and disadvantages incurred in the use of the process. Much discussion was aroused from the floor.

"Colors and Color Matching" presented by J. E. Eagle, Vitro Mfg. Co., Pittsburgh, revealed that much is to be desired in the matter of colors in porcelain enameling. Mr. Eagle pointed out that a high degree of cooperation between enameler and oxide producer is necessary if some of the present difficulties of color control are to be ironed out.

The comparatively new field of architectural porcelain enameling and its problems was discussed by A. C. Weirich, Davidson Enamel Products Co., Lima, O., in his paper "Shop Problems Involved in the Manufacture of Architectural Porcelain Enamel." Beginning with the difficult job of making accurate working drawings, Mr. Weirich gave his attention to all the major difficulties encountered in his experience.

Probably the greatest draw back to porcelain enamel in the architectural field is waviness in flat secuse. Increasing the gage of the metal has helped, as has spraying enamel on both sides of the metal and hanging the pieces during firing. Ripple and mat finishes have also helped but research has only started on this problem.

Mr. Weirich went on to say that customer service is an important factor in this field. Parts arrive at the job in a damaged condition or the contractor will damage parts during erection. In either case replacement must be rapid (within two or three days in most cases) since costs mount rapidly if erection is delayed.

Friday afternoon was devoted to group sessions. Three groups were represented—hollow-ware, cast iron and sheet iron. Papers presented at each session were as follows: Hollow-ware—"Pickle Room Practice," B. T. Sweely, Chicago Vitreous Enamel product Co., Cicero, Ill.; "Control and Consistency of Enamels for Dipping," Walter Wolf, Strong Mfg. Co., Sebring, O. Cast Iron—"Effect of Modern Blast Furnace Practice on the Manufacture of Pig Iron," William Curran, Republic Steel Corp., Birmingham, Ala.; "Molding Sand and Molding Practice," R. B. Schaal, Ferro Enamel Corp., Cleveland; "Abrasive Cleaning Practice and Equipment," R. E. Donnelly, Pangborn Corp., Hagerstown, Md.; "Discussion of Cast Iron Bulletin," G. H. Spencer-Strong, Porcelain Enamel & Mfg. Co., Baltimore. Sheet Iron—"Collection, Handling and Use of Reclaimed Enamels," G. N. Tuttle, Frigidaire Division, General Motors Corp., Dayton, O.; "Ground Coat Dipping," L. E. Nordholt, Tennessee Enamel Mfg. Co., Nashville, Tenn.; "Cleaning and Pickling Practice," D. L. Bensinger, A. B. Stoves Inc., Battle Creek, Mich.; "Control and Consistency of Enamels for Spraying," L. C. Athy, Porcelain Enamel & Mfg. Co., Baltimore. (Read by James J. Theodore)

Freight Rate Increase Heartens Steel Market

Steel Prices Firm; Auto Output Grows; Ingot Rate Drops

MARKET IN TABLOID

DEMAND . . . . *Lags below September rate.*

PRICES . . . . *Scrap continues sharp recession.*

PRODUCTION . . *Operations down 10 points to 53 per cent of capacity.*

SHIPMENTS . . . *Lighter, but exceeds new tonnage.*

WHILE steel consumers are buying only from hand to mouth and are using backlogs of material bought earlier in the year, producers firmly believe the present setback is temporary and not the beginning of a major recession.

Signs that the market is nearing the bottom of the decline are beginning to appear, as buying of certain products shows an upward trend. Sheets are being taken in larger volume, as automotive schedules are increased. Bookings of steel bars are approaching September volume, and cold-finished steel shows improved demand. In tubular goods the downward movement shows definite signs of leveling off.

Tin plate producers are operating at about 85 per cent and sheetmakers at 66 to 67 per cent, both these rates being definitely higher than the average for all steel products. Automotive sheet requirements seem certain to increase steadily and requirements for refrigerator and stove manufacture are at a good rate.

Announcement late Friday by the interstate commerce commission that it has decided to increase freight rates on basic commodities almost to the entire extent asked by the carriers holds a note of encouragement to the steel industry. It is estimated that the increases will provide approximately $47,500,000 per year additional revenue on the basis of the 1936 volume of traffic. Increases asked by railroads but which were denied include iron ore from Minnesota mines to Lake Superior docks.

Buying of new equipment and steel for repair of railroad cars has been held back until definite ideas of revenue could be obtained. Better income is relied on to cause release of considerable tonnage. A secondary result of higher rates would be some buying by general consumers to obtain shipment before the effective date of the increase. On the other hand, since steel prices are fixed until the end of March railroads would not feel pressure to place their orders promptly, as was the case a year ago.

With backlogs cleared in many products and new business failing to keep pace with deliveries steelworks operations last week declined 10 points to 53 per cent of capacity, the lowest level since early February, 1936. Heaviest cuts in production were at the larger centers, Pittsburgh dropping 11 points to 49 per cent, Chicago 11 points to 46 per cent, Eastern Pennsylvania 4 points to 47, and Youngstown 3 points to 55. Wheeling lost 4 points to 70, Cleveland 3 to 65, Buffalo 9.5 to 58, Birmingham 6 to 64, New England 5 to 65, Cincinnati 4 to 66 and St. Louis 8.4 to 51.6. Detroit registered a gain of 3 points to 95 per cent. While some of these schedules will continue this week, further shortening is in prospect at some centers.

Manufacturers of cold-finished bars have reaffirmed current prices, to apply on deliveries to March 31, 1938, on alloy steel and carbon steel grades.

Following action by the leading interest in reaffirming current prices on practically all steel products for first quarter, most independent producers have made similar announcements, thus assuring a steady market through the winter. No action has been taken on pig iron and sharply lower scrap quotations apparently have removed cause for expectation that an advance might be made late this year.

Failure of Ford Motor Co. to get into quantity production on 1938 models held down total automobile output last week. Total units from assembly lines was 91,905, compared with 89,680 the preceding week. General Motors produced 44,970 compared with 43,600, Chrysler 27,675 compared with 27,250 and Ford 765 compared with 300. Other builders brought a total of 18,495 compared with 18,530.

STEEL's composite of steelmaking scrap last week receded 63 cents, to $15.37. This is a fall of $6.71 from the high point of $22.08 reached the first week in April and is the lowest level since the latter half of August, 1936, when it stood at $15.13. Scrap's decline lowered the composite for iron and steel products by 13 cents, to $39.47. The finished steel composite is unchanged at $61.70.

COMPOSITE MARKET AVERAGES

	Oct. 23	Oct. 16	Oct. 9	One Month Ago Sept., 1937	Three Months Ago July, 1937	One Year Ago Oct., 1936	Five Years Ago Oct., 1932
Iron and Steel	$39.47	$39.60	$39.73	$40.16	$40.03	$34.67	$28.90
Finished Steel	61.70	61.70	61.70	61.70	61.70	53.90	47.64
Steelworks Scrap ..	15.37	16.00	16.67	18.99	18.51	16.44	6.96

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates ,shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Oct. 23, 1937	Sept. 1937	July 1937	Oct. 1936
Steel bars, Pittsburgh	2.45c	2.45c	2.45c	2.05c
Steel bars, Chicago	2.50	2.50	2.50	2.10
Steel bars, Philadelphia	2.74	2.74	2.74	2.36
Iron bars, Terre Haute, Ind.	2.35	2.35	2.35	1.95
Shapes, Pittsburgh	2.25	2.25	2.25	1.90
Shapes, Philadelphia	2.45½	2.45½	2.45½	2.11½
Shapes, Chicago	2.30	2.30	2.30	1.95
Tank plates, Pittsburgh	2.25	2.25	2.25	1.90
Tank plates, Philadelphia	2.43½	2.43½	2.43½	2.09
Tank plates, Chicago	2.30	2.30	2.30	1.95
Sheets, No. 10, hot rolled, Pitts.	2.40	2.40	2.40	1.95
Sheets, No. 24, hot ann., Pitts.	3.15	3.15	3.15	2.60
Sheets, No. 24, galv., Pitts.	3.80	3.80	3.80	3.20
Sheets, No. 10, hot rolled, Gary	2.50	2.50	2.50	2.05
Sheets, No. 24, hot anneal., Gary	3.25	3.25	3.25	2.70
Sheets, No. 24, galvan., Gary	3.90	3.90	3.90	3.30
Plain wire, Pittsburgh	2.90	2.90	2.90	2.50
Tin plate, per base box, Pitts.	$5.35	$5.35	$5.35	$5.25
Wire nails, Pittsburgh	2.75	2.75	2.75	2.05

Semifinished Material

Sheet bars, open-hearth, Youngs.	$37.00	$37.00	$37.00	$32.00
Sheet bars, open-hearth, Pitts.	37.00	37.00	37.00	32.00
Billets, open-hearth, Pittsburgh	37.00	37.00	37.00	32.00
Wire rods, No. 5 to $\frac{5}{32}$-inch, Pitts.	47.00	47.00	47.00	40.00

Pig Iron

	Oct. 23, 1937	Sept. 1937	July 1937	Oct. 1936
Bessemer, del. Pittsburgh	$25.26	$25.26	$25.26	$20.8132
Basic, Valley	23.50	23.50	23.50	19.00
Basic, eastern del. East. Pa.	25.26	25.26	25.26	20.81
No. 2 fdy., del. Pittsburgh	25.21	25.21	25.21	20.3132
No. 2 fdy., Chicago	24.00	24.00	24.00	19.50
Southern No. 2, Birmingham	20.38	20.38	20.38	15.56
Southern No. 2, del. Cincinnati	23.69	23.69	23.69	19.44
No. 2 X eastern, del. Phila.	26.135	26.135	26.135	21.68
Malleable, Valley	24.00	24.00	24.00	19.50
Malleable, Chicago	24.00	24.00	24.00	19.50
Lake Sup., charcoal, del. Chicago	30.04	30.04	30.04	25.7528
Gray forge, del. Pittsburgh	24.17	24.17	24.17	19.6741
Ferromanganese, del. Pittsburgh	107.29	107.29	107.29	80.13

Scrap

Heavy melting steel, Pittsburgh	$15.75	$20.40	$19.40	$18.15
Heavy melt. steel, No. 2, E. Pa.	13.75	16.69	18.00	13.95
Heavy melting steel, Chicago	14.00	17.85	17.05	16.25
Rails for rolling, Chicago	16.75	20.35	20.30	16.95
Railroad, steel specialties, Chicago	18.75	20.50	20.20	17.75

Coke

Connellsville, furnace, ovens	$4.37	$4.45	$4.50	$4.00
Connellsville, foundry, ovens	5.25	5.25	5.30	4.25
Chicago, by-product foundry, del.	11.00	11.00	11.00	9.75

Steel, Iron, Raw Material, Fuel and Metals Prices

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Prices Subject to Quantity Extras and deductions (Except Galvanized)

Hot Rolled No. 10, 24-48 in.

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, del.	2.60c
New York, del.	2.73c
Philadelphia, del.	2.69c
Birmingham	2.55c
St. Louis, del.	2.63c
Granite City, Ill.	2.60c
Pacific ports, f.o.b. dock	2.95c

Hot Rolled Annealed No. 24

Pittsburgh	3.15c
Gary	3.25c
Chicago, delivered	3.28c
Detroit, delivered	3.35c
New York, del.	3.48c
Philadelphia, del.	3.44c
Birmingham	3.30c
St. Louis, del.	3.38c
Granite City, Ill.	3.35c
Pacific ports, f.o.b. dock	3.80c

Galvanized No. 24

Pittsburgh	3.80c
Gary	3.90c
Chicago, delivered	3.93c
Philadelphia, del.	4.09c
New York, delivered	4.13c
Birmingham	3.95c
St. Louis, del.	4.03c
Granite City, Ill.	4.00c
Pacific ports, f.o.b. dock	4.40c

Tin Mill Black No. 28

Pittsburgh	3.30c
Gary	3.40c
St. Louis, delivered	3.53c
Granite City, Ill.	3.50c

Cold Rolled No. 10

Pittsburgh	3.10c
Gary	3.20c
Detroit, delivered	3.30c
Philadelphia, del.	3.39c
New York, del.	3.43c
St. Louis, del.	3.33c
Granite City, Ill.	3.30c
Pacific ports, f.o.b. dock	3.70c

Cold Rolled No. 20

Pittsburgh	3.55c
Gary	3.65c
Detroit, delivered	3.75c
Philadelphia, del.	3.84c
New York, del.	3.88c
St. Louis	3.78c
Granite City, Ill.	3.75c

Enameling Sheets

Pittsburgh, No. 10	2.90c
Pittsburgh, No. 20	3.50c
Gary, No. 10	3.00c
Gary, No. 20	3.60c
St. Louis, No. 10	3.13c
St. Louis, No. 20	3.73c

Tin and Terne Plate

Gary base, 10 cents higher

Tin plate, coke, (base box), Pittsburgh	$5.35
Waste-waste, 2.75c; strip	2.50c
Long ternes, No. 24, unassorted, Pitts.	4.10c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.25c
New York, del.	2.53c
Philadelphia, del.	2.43½c
Boston, delivered	2.65c
Buffalo, delivered	2.50c
Chicago or Gary	2.30c
Cleveland, del.	2.44½c
Birmingham	2.40c
Coatesville, base	2.35c
Sparrows Pt., base	2.35c
Pacific ports, f.o.b. cars, dock	2.80c
St. Louis, delivered	2.52c

Structural Shapes

Pittsburgh	2.25c
Philadelphia, del.	2.45½c
New York, del.	2.50¼c
Boston, delivered	2.63¼c
Bethlehem	2.35c
Chicago	2.30c
Cleveland, del.	2.45c
Buffalo	2.35c
Gulf Ports	2.65c
Birmingham	2.40c
Pacific ports, f.o.b. cars, dock	2.80c
St. Louis, del.	2.52c

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	2.45c
Chicago or Gary	2.50c
Duluth	2.60c
Birmingham	2.60c
Cleveland	2.50c
Buffalo	2.55c
Detroit, delivered	2.60c
Pacific ports, f.o.b. cars, dock	3.00c
Philadelphia, del.	2.74c
Boston, delivered	2.85c
New York, del.	2.78c
Pitts., forg. qual.	2.80c

Rail Steel

To Manufacturing Trade

Pittsburgh	2.30c
Chicago or Gary	2.35c
Cleveland	2.35c
Moline, Ill.	2.35c
Buffalo	2.40c
Birmingham	2.45c

Iron

Terre Haute, Ind.	2.35c
Chicago	2.40c
Philadelphia	2.64c
Pittsburgh, refined	3.50-8.00c

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.55c
Chicago, Gary, Buffalo, Cleve., Birm., Young	2.60c
Gulf ports	2.90c
Pacific coast ports, f.o.b. car docks	2.95c
Philadelphia, del.	2.84c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	2.40c
Chicago, Buffalo, Cleveland, Birm., Young	2.45c
Gulf ports	2.80c

Wire Products

Prices apply to mixed carloads, base; less carloads subject to quantity extras.

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.75
Cement coated nails	$2.75

(Per pound)

Polished staples	3.45c
Galv. fence staples	3.70c
Barbed wire, galv.	3.40c
Annealed fence wire	3.15c
Galv. fence wire	3.55c
Woven wire fencing (base C. L. column)	74
Single loop bale ties, (base C. L. column)	63

To Manufacturing Trade

Plain wire, 6-9 ga.	2.90c

Anderson, Ind. (merchant products only) and Chicago up $1; Duluth and Worcester up $2; Birmingham up $3.

Spring wire, Pitts. or Cleveland	3.50c

Do., Chicago up $1, Worc. $2.

Cold-Finished Carbon Bars and Shafting

Pittsburgh	2.90c
Chicago	2.95c
Gary, Ind.	2.95c
Detroit	2.95c
Cleveland	2.95c
Buffalo	3.00c

Subject to quantity deductions and extras. List dated Aug. 26, 1935; revised Oct. 1, 1936.

Alloy Steel Bars (Hot)

(*Base, 3 to 25 tons*)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	3.00c

Alloy	Diff.	Alloy	Diff.
S.A.E.		S.A.E.	
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20
4100 0.15 to 0.25 Mo.			0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni.			1.10
5100 0.80-1.10 Cr.			0.45
5100 Cr. spring			0.15
6100 bars			1.20
6100 spring			0.85
Cr. N., Van			1.50
Carbon Van.			0.85
9200 spring flats			0.15
9200 spring rounds, squares			0.40

Piling

Pittsburgh	2.60c
Chicago, Buffalo	2.70c

Strip and Hoops

(Base, hot rolled, 25-1ton)
(Base, cold-rolled, 25-3 tons)

Hot strip to 23/4-in. Pittsburgh	2.40c
Chicago or Gary	2.50c
Birmingham base	2.55c
Detroit, del.	2.60c
Philadelphia, del.	2.69c
New York, del.	2.73c
Cooperage hoop, Pittsburgh	2.50c
Chicago	2.60c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland	3.20c
Detroit, del.	3.40c
Worcester, Mass.	3.40c

Carbon	Cleve. Pitts.	Worcester, Mass.
0.26—0.50	3.20c	3.40c
0.51—0.75	4.45c	4.65c
0.76—1.00	6.30c	6.50c
Over 1.00	8.50c	8.70c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$42.50
Relay rails, Pittsburgh, 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pittsburgh, Chicago	$43.00
Do., rerolling quality	42.00
Angle bars, billet, Gary, Pittsburgh, So. Chicago	2.80c
Do., axle steel	3.35c
Spikes, R. R. base	3.15c
Track bolts, base	4.35c
Tie plates, base	$46.00

Base, light rails 25 to 60 lbs.; 20 lbs. up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists:

Carriage and Machine

1/2 x 6 and smaller	65-5 off
Do. larger, to 1-in.	60-10 off
Do. 1 1/8 and 1 1/4-in.	60-5 off
Tire bolts	50 off

Plow Bolts

All sizes	65-5 off

Stove Bolts

In packages with nuts attached 70 off; in packages with nuts separate 70-10 off; in bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	50-10-5 off
Elevator bolts	50-10-5 off

Nuts

S. A. E. semifinished hex.: 1/2 to 7/8-inch	60-10 off
Do., 9/16 to 1-inch	60-5 off
Do., over 1-inch	60 off

Hexagon Cap Screws

Milled	50-10 off
Upset, 1-in., smaller	60 off

Square Head Set Screws

Upset, 1-in., smaller	75 off
Headless set screws	75 off

Rivets, Wrought Washers

Structural, Pittsburgh, Cleveland	3.60c
Structural, Chicago	3.70c
7/8-inch and smaller, Pitts., Chi., Cleve.	65-5 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75 off	

Cut Nails

Cut nails, C. L., Pitts. (10% disc. on all extras)	$3.60
Do., less carloads, 5 kegs or more, no discount on any extras	$3.90
Do., under 5 kegs no disc. on any extras	$4.05

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2 1/2 less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Galv.
1/8	59 1/2	49
1/4	62 1/2	53
1—3	64 1/2	55 1/2

Iron

1/4	26	8
1—1 1/4	30	14
1 1/2	34	16 1/2
2	33 1/2	16

Lap Weld

Steel

2	57	47 1/2
2 1/2—3	60	50 1/2
3 1/2—6	62	52 1/2
7 and 8	61	50 1/2
9 and 10	60 1/2	50

Iron

2	26 1/2	10
2 1/2—3 1/2	27 1/2	12 1/2
4	29 1/2	16
4 1/2—8	28 1/2	15
9–12	24 1/2	10

Line Pipe

Steel

1 to 3, butt weld	63 1/2
2, lap weld	56
2 1/2 to 3, lap weld	59
3 1/2 to 6, lap weld	61
7 and 8, lap weld	60
10-inch, lap weld	59 1/2
12-inch, lap weld	58 1/2

Butt Weld

Iron

	Blk.	Galv.
1/4	25	7
1 and 1 1/4	29	13
1 1/2	33	15 1/2
2	32 1/2	15

Lap Weld

1 1/2	23 1/2	7
2	25 1/2	9
2 1/2 to 3 1/2	26 1/2	11 1/2
4	28 1/2	15
4 1/2 to 8	27 1/2	14
9 to 12	23 1/2	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Weld

Sizes	Steel	Charcoal Iron
1 1/2" OD x 13 Ga.	$10.45	$23.71
1 3/4" OD x 13 Ga.	11.89	22.93
2" OD x 13 Ga.	13.31	19.35
2" OD x 11 Ga.	15.49	23.36
2 1/4" OD x 13 Ga.	14.82	21.68
2 1/4" OD x 11 Ga.	17.38	26.02
2 1/2" OD x 12 Ga.	17.82	26.57
2 3/4" OD x 12 Ga.	18.86	29.00
3" OD x 12 Ga.	19.73	31.36
3 1/2" OD x 11 Ga.	24.89	39.81
4" OD x 10 Ga.	30.81	49.90
5" OD x 9 Ga.	47.57	73.93
6" OD x 7 Ga.	73.25	.....

Seamless

	Hot Rolled	Cold Drawn
1" OD x 13 Ga.	$ 8.41	$ 9.46
1 1/4" OD x 13 Ga.	9.96	11.21
1 1/2" OD x 13 Ga.	11.00	12.38
1 3/4" OD x 13 Ga.	12.51	14.09
2" OD x 13 Ga.	14.02	15.78
2 1/4" OD x 13 Ga.	15.63	17.60
2 1/2" OD x 12 Ga.	17.21	19.37
2 1/2" OD x 12 Ga.	18.85	21.22
2 3/4" OD x 12 Ga.	19.98	22.49
3" OD x 12 Ga.	20.97	23.60
4 1/2" OD x 10 Ga.	40.15	45.19
3 1/2" OD x 11 Ga.	26.47	29.79
4" OD x 10 Ga.	32.83	36.94
5" OD x 9 Ga.	50.38	56.71
6" OD x 7 Ga.	77.35	87.07

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$46.00-47.00
4-in., Birmingham	49.00-50.00
4-in., Chicago	57.00-58.00
6 to 24-in., Chicago	54.00-55.00
6-in. & over, east fdy.	50.00
Do., 4-in.	53.00

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Billets and Blooms

4 x 4-*inch base; gross ton*

Pitts., Chi., Cleve., Buffalo, Young., Bham.	$37.00
Philadelphia	42.30
Duluth	39.00

Forging Billets

6 x 6 *to* 9 x 9-*in., base*

Pitts., Chicago, Buffalo	43.00
Forging, Duluth	45.00

Sheet Bars

Pitts., Cleve., Young., Sparrows Point	37.00

Slabs

Pitts., Chicago, Cleveland, Youngstown	37.00

Wire Rods

Pitts., Cleve., No. 5 to 5/16-inch incl.	47.00
Do., over 5/16 to 11/32-inch incl.	52.00

Chicago up $1; Worcester up $2.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	2.10c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$4.25- 4.50
Connellsville, fdry.	5.00- 5.50
Connell. prem. fdry.	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.75- 6.00
Wise county fur.	4.75- 5.00

By-Product Foundry

Newark, N. J., del.	10.85-11.30
Chi., ov., outside del.	10.25
Chicago, del.	11.00
Milwaukee, ovens	11.00
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.50
Indianapolis, del.	10.50
Cincinnati, del.	10.50
Cleveland, del.	11.00
Buffalo, del.	10.50
Detroit, del.	11.10
Philadelphia, del.	10.60

Coke By-Products

Spot, gal. Producers' Plants

Pure and 90% benzol	16.00c
Toluol	30.00c
Solvent naphtha	30.00c
Industrial xylol	30.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
do. (450 lbs.)	15.25c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls. to jobbers	7.25c

Per ton, bulk, f.o.b. oven or port	
Sulphate of ammonia	$28.50

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:

	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$25.00	$25.50	$23.50	$26.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Birmingham, Ala.‡	20.38	.....	19.38	25.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	.....	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.75	26.25	25.25	26.75
Hamilton, O.	24.00	24.00	23.50	.....
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	.....	.....	.....
Sharpsville, Pa.	24.00	24.00	23.50	24.50
Sparrows Point, Md.	25.00	.....	24.50	.....
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00	24.00	23.50	24.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:

Akron, O., from Cleveland	25.26	25.26	24.76	25.76
Baltimore from Birmingham	25.58	.....	24.46	.....
Boston from Birmingham	26.37	.....	25.87	.....
Boston from Everett, Mass.	26.25	26.75	25.75	27.25
Boston from Buffalo	26.25	26.75	25.75	27.25
Brooklyn, N. Y., from Bethlehem	27.27	27.77	.....	.....
Brooklyn, N. Y., from Bmghm.	27.05	.....	.....	.....
Canton, O., from Cleveland	25.26	25.26	25.76	25.76
Chicago from Birmingham	24.22	.....	24.10	.....
Cincinnati from Hamilton, O.	24.07	25.01	24.51	.....
Cincinnati from Birmingham	23.69	.....	22.69	.....
Cleveland from Birmingham	24.12	.....	23.62	.....
Mansfield, O., from Toledo, O.	25.76	25.76	25.26	25.26
Milwaukee from Chicago	25.00	25.00	24.50	25.00
Muskegon, Mich., from Chicago, Toledo or Detroit	26.90	26.90	26.40	27.40
Newark, N. J., from Birmingham	26.01	.....	.....	.....
Newark, N. J., from Bethlehem	26.39	26.89	.....	.....
Philadelphia from Birmingham	25.38	.....	25.26	.....
Philadelphia from Swedeland, Pa.	25.76	26.26	25.26	.....
Pittsburgh district from Neville Island	{ Neville, base plus 63c, 76c, and $1.13 switch'g charges			
Saginaw, Mich., from Detroit	26.25	26.25	25.75	25.75
St. Louis, northern	24.50	24.50	24.00	.....
St. Louis from Birmingham	†24.12	.....	23.82	.....
St. Paul from Duluth	25.94	25.94	.....	26.44

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $28.50, Phila. base, standard and copper bearing, $29.63.

Gray Forge		Charcoal	
Valley furnace	$23.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	23.50	do., del. Chicago	30.04
		Lyles, Tenn.	26.50

Silvery†

Jackson county, O., base: 6-6.50 per cent $28.50; 6.51-7—$29.00; 7-7.50—$29.50; 7.51-8—$30.00; 8-8.50—$30.50; 8.51-9—$31.00; 9-9.50—$31.50; Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$64.60

First Quality

Pa., Ill., Md., Mo., Ky.	51.30
Alabama, Georgia	51.30
New Jersey	56.00

Second Quality

Pa., Ill., Ky., Md., Mo.	46.55
Georgia, Alabama	41.80
New Jersey	51.00

Ohio

First quality	43.70
Intermediate	39.90
Second quality	35.15

Malleable Bung Brick

All bases	$59.85

Silica Brick

Pennsylvania	$51.30
Joliet, E. Chicago	59.85
Birmingham, Ala.	51.30

Ladle Brick
(Pa., O., W. Va., Mo.)

Dry press	$30.00
Wire cut	$28.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	43.00

Base Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$49.00
Chem. bonded chrome	49.00
Magnesite brick	69.00
Chem. bonded magnesite	59.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$24.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$20.00
Do., for barge	$22.00
No. 2 lump	22.00-23.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82%, tidewater, duty pd.	$102.50
Do., Baltimore, base	102.50
Do., del. Pittsburgh	107.29
Spiegeleisen, 19-21% dom. Palmerton, Pa., spot	33.00
Do., New Orleans	33.00
Do., 26-28%, Palmerton	39.00
Ferrosilicon, 50% freight allowed, c.l.	69.50
Do., less carload	77.00
Do., 75 per cent.	126-130.00
Spot, $5 a ton higher.	
Silicoman., 2¼ carbon	106.50
2% carbon 111.50; 1%,	121.50
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.50
Ferrotungsten, stand., lb. con. del. cars	2.95-3.00
Ferrovanadium, 35 to 40% lb., cont.	2.70-2.90
Ferrotitanium, c. l., prod. plant, frt. all., net ton	142.50
Spot, carlots	145.00
Spot, ton lots	150.00
Ferrophosphorous, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, $3 unitage	63.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $3 unitage	80.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads. Quan. diff. apply

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin, New York: Spot	Straits Tin, New York: Future	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony American Spot. N. Y.	Nickel Cathodes
Oct. 16	12.00	13.12½	11.75	50.87½	50.12½	5.75	5.60	6.00	20.00	16.50	35.00
Oct. 18	12.00	13.12½	11.75	50.37½	49.62½	5.50	5.35	6.00	20.00	16.50	35.00
Oct. 19	12.00	13.12½	11.75	48.37½	47.87½	5.50	5.35	6.00	20.00	17.25	35.00
Oct. 20	12.00	13.12½	11.75	48.37½	47.87½	5.50	5.35	6.00	20.00	17.25	35.00
Oct. 21	12.00	13.12½	11.75	50.37½	49.87½	5.50	5.35	6.00	20.00	17.25	35.00
Oct. 22	12.00	13.12½	11.75	49.62½	49.12½	5.50	5.35	6.00	20.00	17.25	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 13.00c Conn. copper

Sheets

Yellow brass (high)	19.25
Copper, hot rolled	21.12½
*Lead, cut to jobbers	9.00
Zinc, 100-lb. base	11.00

Tubes

High, yellow brass	22.00
Seamless copper	21.87½

Rods

High yellow brass	15.75
Copper, hot rolled	17.62½

Anodes

Copper, untrimmed	18.37½

Wire

Yellow brass (high)	19.50

OLD METALS

Nom. Deal. buying prices

No. 1 Composition Red Brass

*New York	6.37½-6.62½
*Cleveland	6.87½-7.12½
*Chicago	6.62½-6.87½
*St. Louis	6.75-7.00

Heavy Copper and Wire

*New York, No. 1	8.25-8.50
*Cleveland, No. 1	8.25-8.50
*Chicago, No. 1	8.25-8.50
*St. Louis	8.25-8.50

Composition Brass Borings

*New York	6.00-6.25

Light Copper

*New York	6.25-6.50
*Cleveland	6.25-6.50
*Chicago	6.25-6.50
*St. Louis	6.25-6.75

Light Brass

*Cleveland	3.25-3.50
*Chicago	4.25-4.50
*St. Louis	4.00-4.50

Lead

New York	5.25
Cleveland	5.00-5.25
Chicago	4.50-4.75
St. Louis	4.00-4.50

Zinc

New York	3.25-3.50
Cleveland	3.00-3.25
St. Louis	2.75-3.00

Aluminum

Borings, Cleveland	9.75-10.00
Mixed cast, Cleve.	13.25-13.50
Clips, soft, Cleve.	15.25-15.50
Mixed cast, St. L.	12.00-12.25

SECONDARY METALS

Brass, ingot, 85-5-5-5, lcl.	13.25
Stand. No. 12 alum.	18.50

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

Baltimore	4.00c
Birmingham	3.85c
Boston††	4.05c
Buffalo	3.90c
Chattanooga	4.21c
Chicago (j)	3.85c
Cincinnati	4.05c
Cleveland	3.75c
Detroit	3.93½c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.96c-4.11c
New Orleans	4.20c
New York‡ (d)	4.12c
Pitts. (h)	3.80c
Philadelphia	4.00c
Portland	4.50c
San Francisco	4.20c
Seattle	4.45c
St. Louis	4.09c
St. Paul	4.10c-4.25c
Tulsa	3.35c

IRON BARS

Portland	3.50c
Chattanooga	4.21c
Baltimore*	3.25c
Cincinnati	4.05c
New York‡ (d)	3.65c
Philadelphia	4.00c
St. Louis	4.09c

REINFORCING BARS

Buffalo	3.10c
Birmingham	3.85c
Chattanooga	4.21c
Cleveland (c)	2.55c
Cincinnati	3.75c
Houston	3.25c
Los Angeles, c.l.	2.975c
New Orleans*	3.24c
Pitts., plain (h)	2.55c
Pitts., twisted squares (h)	3.95c
San Francisco	2.97½c
Seattle	2.975c
St. Louis	3.99c
Tulsa	3.25c
Young	2.30c-2.60c

SHAPES

Baltimore	3.90c
Birmingham	3.75c
Boston††	3.92c
Buffalo	3.80c
Chattanooga	4.11c
Chicago	3.75c
Cincinnati	3.95c
Cleveland	3.86c
Detroit	3.95c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.86c
New Orleans	4.10c
New York‡ (d)	3.97c
Philadelphia	3.90c
Pittsburgh (h)	3.70c
Portland (i)	4.25c
San Francisco	4.05c
Seattle (i)	4.25c
St. Louis	3.99c
St. Paul	4.00c
Tulsa	3.60c

PLATES

Baltimore	3.90c
Birmingham	3.75c
Boston††	3.93c
Buffalo	3.80c
Chattanooga	4.11c
Chicago	3.75c
Cincinnati	3.95c
Cleve., ¼-in., o'r	3.86c
Detroit	3.95c
Detroit, ⅜-in.	4.15c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.86c
New Orleans	4.10c
New York‡ (d)	4.00c
Philadelphia	3.90c
Phila. floor	5.25c
Pittsburgh (h)	3.70c
Portland	4.25c
San Francisco	4.05c
Seattle	4.25c
St. Louis	3.99c
St. Paul	4.00c
Tulsa	3.60c

NO. 10 BLUE

Baltimore	3.95c
Birmingham	3.80c
Boston (g)	4.00c
Buffalo, 8-10 ga.	3.97c
Chattanooga	4.16c
Chicago	3.85c
Cincinnati,	4.00c
Cleveland	3.91c
Det. 8-10 ga.	3.93½c
Houston	3.45c
Los Angeles	4.50c
Milwaukee	3.96c
New Orleans	4.35c
New York‡ (d)	4.07c
Portland	4.25c
Philadelphia	4.00c
Pittsburgh (h)	3.75c
San Francisco	4.30c
Seattle	4.50c
St. Louis	4.39c
St. Paul	4.10c
Tulsa	3.80c

NO. 24 BLACK

Baltimore*†	4.50c
Birmingham	4.40c
Boston (g)	4.75c
Buffalo	4.80c
Chattanooga*	4.06c
Chicago	4.45c-5.10c
Cincinnati	4.75c
Cleveland	4.66c
Detroit	4.68½c
Los Angeles	5.05c
Milwaukee	4.56c-5.21c
New York‡ (d)	4.82c
Philadelphia	4.65c
Pitts.** (h)	4.75c
Portland	5.15c
Seattle	5.35c
San Francisco	5.15c
St. Louis	4.84c
St. Paul	4.75c
Tulsa	4.85c

NO. 24 GALV. SHEETS

Baltimore*†	4.70c
Birmingham	5.05c
Buffalo	5.45c
Boston (g)	5.30c
Chattanooga*	4.76c
Chicago (h)	5.10c-5.75c
Cincinnati	5.40c
Cleveland	5.31c
Detroit	5.40c
Houston	4.50c
Los Angeles	5.75c
Milwaukee	5.21c-5.86c
New Orleans*	5.75c
New York‡ (d)	5.47c
Philadelphia	5.30c
Pitts.** (h)	5.40c
Portland	5.90c
San Francisco	5.85c
Seattle	5.90c
St. Louis	5.49c
St. Paul	5.40c
Tulsa	5.20c

BANDS

Baltimore	4.20c
Boston††	4.25c
Buffalo	4.22c
Chattanooga	4.41c
Cincinnati	4.25c
Cleveland	4.16c
Chicago	4.10c
Detroit, 3/16 & Und.	4.185c
Houston	3.35c
Los Angeles	4.80c
Milwaukee	4.21c
New Orleans	4.75c
New York‡ (d)	4.32c
Philadelphia	4.10c
Pittsburgh (h)	4.00c
Portland	5.00c
San Francisco	4.80c
Seattle	4.95c
St. Louis	4.34c
St. Paul	4.35c

HOOPS

Baltimore	4.45c
Boston††	5.25c
Buffalo	4.22c
Chicago	4.10c
Cincinnati	4.25c
Detroit, 14 & Und.	4.185c
Los Angeles	6.55c
Milwaukee	4.21c
New York‡ (d)	4.32c
Philadelphia	4.35c
Pittsburgh (h)	4.50c
Portland	6.50c
San Francisco	6.50c
Seattle	6.30c
St. Louis	4.34c
St. Paul	4.35c

COLD FIN. STEEL

Baltimore (c)	4.50c
Birmingham	4.91c
Boston*	4.65c
Buffalo (h)	4.35c
Chattanooga*	4.86c
Chicago (h)	4.30c
Cincinnati	4.50c
Cleveland (h)	4.30c
Detroit	4.30c
Los Ang. (f) (d)	6.85c
Milwaukee	4.41c
New Orleans	5.10c
New York‡ (d)	4.57c
Philadelphia	4.53c
Pittsburgh	4.15c
Portland (f) (d)	7.10c
San Fran. (f) (d)	6.80c
Seattle (f) (d)	7.10c
St. Louis	4.54c
St. Paul	4.77c
Tulsa	4.80c

COLD ROLLED STRIP

Boston	3.845c
Buffalo	3.79c
Chicago	3.87c
Cincinnati	3.82c
Cleveland (b)	3.60c
Detroit	3.43c
New York‡ (d)	3.92c
St. Louis	4.54c

TOOL STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up.)

	Base
High speed	69c
High carbon, Cr.	45c
Oil hardening	26c
Special tool	24c
Extra tool	20c
Regular tool	16c
Water hardening	12½c

Uniform extras apply.

BOLTS AND NUTS

(100 pounds or over)

	Discount
Birmingham	50-10
Chicago (a)	55 to 60
Cleveland	60-5-5
Detroit	70-10
Milwaukee	60 to 65
New Orleans	60
Pittsburgh	65-5

(a) Under 100 lbs., 50 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Quantity base; (e) New mill classif. (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (i) Under 3 in.; (j) Shapes other than rounds, flats, fillet angles, 0.15c higher.

On plates, shapes, bars, hot strip and blue annealed quantity extras and discounts as follows: Under 100 lbs., add $1.50; 100 to 399 lbs., add 50c; 400 to 3999 lbs., base; 4000 to 9999 lbs., deduct 10c; over 10,000 lbs., deduct 15c. At Cleveland, under 400 lbs., add 50c, with $1 minimum invoice.

‡Domestic steel; *Plus quantity extras; **One to 9 bundles; *† 50 or more bundles; †New extras apply; ††Base 10,000 lbs., extras on less.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Oct. 21

Export Prices f. o. b. Ship at Port of Dispatch—(By Cable or Radio)

	British gross tons U. K. ports				Continental Channel or North Sea ports, metric tons		
		£	s	d	Quoted in dollars at current value		**Quoted in gold pounds sterling £ s d
PIG IRON							
Foundry, 2.50-3.00 Silicon	$29.76	6	0	0	$22.36		2 15 6
Basic bessemer	19.47	3	18	6	20.95		2 12 0
Hematite, Phos. .03-.05	35.96	7	5	0*	.....		.....
SEMIFINISHED STEEL							
Billets	$39.06	7	17	6	$43.20		5 7 6
Wire rods, No. 5 gage	53.69	10	16	6	49.22		6 2 6
FINISHED STEEL							
Standard rails	$50.22	10	2	6	$46.20		5 15 0
Merchant bars	2.43c	11	0	0	2.18c to 2.28c		6 0 0 to 6 5 0
Structural shapes	2.35c	10	12	6	1.96c		5 7 6
Plates, †¼ in. or 5 mm.	2.56c	11	11	3	2.59c		7 2 6
Sheets, black, 24 gage or 0.5 mm	3.32c	15	0	0	3.18c		8 15 0††
	4.14c	18	15	0	4.01c		11 0 0
Sheets, gal., 24 gage, corr.	3.04c	13	15	0	2.37c		6 10 0
Bands and strips	4.31c	19	10	0	2.54c		7 0 0
Plain wire, base	.....				.....		.....
Galvanized wire, base	5.14c	23	5	0	3.18c		8 15 0
Wire nails, base	4.09c	18	10	0	2.90c		8 0 0
Tin plate, box 108 lbs.	$ 6.45	1	6	0	.....		.....

British ferromanganese $102.50 delivered Atlantic seaboard, duty-paid.

Domestic Prices at Works or Furnace—Last Reported

		£	s	d	French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$25.05	5	1	0 (a)	$17.12	505	$26.24	800	$25.31 63
Basic bessemer pig iron	24.80	5	0	0 (a)	.....	.....	.....	...	27.93 (b) 69.50
Furnace coke	9.30	1	17	6	6.03	178	7.05	215	7.63 19
Billets	39.06	7	17	6	25.68	757.50	31.49	960	38.77 96.50
Standard rails	2.24c	10	2	6	1.62c	1,080	2.06c	1,375	2.38c 132
Merchant bars	2.53c	11	9	0	1.49c	995	1.65c	1,100	1.98c 110
Structural shapes	2.44c	11	0	6	1.46c	970	1.65c	1,100	1.93c 107
Plates, †¼-in. or 5 mm.	2.59c	11	14	3	1.86c	1,240	2.06c	1,375	2.29c 127
Sheets, black	3.48c	15	15	0§	2.48c	1,650‡	2.36c	1,575‡	2.59c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	4.31c	19	10	0	3.38c	2,250	2.85c	1,900	6.66c 370
Plain wire	4.31c	19	10	0	2.28c	1,520	2.48c	1,650	3.11c 173
Bands and strips	2.70c	12	4	0	1.68c	1,120	2.33c	1,550	2.29c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel a del. Middlesbrough. b nemetite. ††Close annealed.

**Gold pound sterling carries a premium of 65.5 per cent over paper sterling.

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham,† No. 1	14.00
Birmingham,† No. 2	13.00
Bos. dock No. 1 exp.	14.00
N. Eng. del. No. 1..	14.50-15.00
Buffalo, No. 1	16.00-16.50
Buffalo, No. 2	14.00-14.50
Chicago, No. 1.....	13.75-14.25
Cleveland, No. 1...	15.00-15.50
Cleveland, No. 2...	14.00-14.50
Detroit, No. 1	12.50-13.00
Eastern Pa., No. 1..	16.00-16.50
Eastern Pa., No. 2..	13.50-14.00
Federal, Ill.	13.00-13.50
Granite City, R. R.	15.50-16.00
Granite City, No. 2.	13.00-13.50
New York, No. 1..	†14.00
N. Y. dock No. 1 exp.	13.00
Pitts., No. 1 (R. R.)	16.50-17.00
Pitts., No. 1 (dlr.)..	15.50-16.00
Pittsburgh, No. 2...	14.00-14.50
St. Louis, R. R.....	15.00-15.50
St. Louis, No. 2....	13.00-13.50
Toronto, dlrs. No. 1.	12.00
Toronto, No. 2	11.00
Valleys, No. 1	16.50-17.00

COMPRESSED SHEETS

Buffalo, dealers....	14.00-14.50
Chicago, factory...	13.50-14.00
Chicago, dealer	13.00-13.50
Cleveland	14.50-15.00
Detroit	13.50-14.00
E. Pa., new mat.	16.00-16.50
E. Pa., old mat.	11.00-11.50
Pittsburgh	16.00-16.50
St. Louis	10.00-10.50
Valleys	16.00-16.50

BUNDLED SHEETS

Buffalo	10.00-10.50
Cincinnati, del.	11.50-12.00
Cleveland	11.00-11.50
Pittsburgh	15.00-15.50
St. Louis	9.50-10.00
Toronto, dealers ...	8.00

SHEET CLIPPINGS, LOOSE

Chicago	10.00-10.50
Cincinnati	9.50-10.00
Detroit	10.00-10.50
St. Louis	8.50- 9.00

STEEL RAILS, SHORT

Birmingham	15.00
Buffalo	20.50-21.00
Chicago (3 ft.).....	17.50-18.00
Chicago (2 ft.).....	18.50-19.00
Cincinnati, del.	18.50-19.00
Detroit	18.50-19.00
Pitts., 3 ft. and less	20.50-21.00
St. Louis, 2 ft. & less	17.00-17.50

STEEL RAILS, SCRAP

Boston district ....†	14.00-14.50
Buffalo	17.00-17.50
Chicago	13.75-14.25
Cleveland	18.00-18.50
Pittsburgh	18.00-18.50
St. Louis	15.50-16.00

STOVE PLATE

Birmingham	9.50-10.00
Boston district	†8.50
Buffalo	13.00-13.50
Chicago	10.00-10.50
Cincinnati, dealers..	8.50- 9.00
Detroit, net .....†	10.00-10.50
Eastern Pa.	14.00-14.50
New York, fdry. ...†	10.00-10.50
St. Louis	11.00-11.50
Toronto, deal'rs, net	10.00

SPRINGS

Buffalo	20.00-21.00
Chicago, coil	20.50-21.00
Chicago, leaf	18.50-19.00
Eastern Pa.	23.00-23.50
Pittsburgh	20.50-21.00
St. Louis	20.00-20.50

ANGLE BARS—STEEL

Chicago	15.50-16.00
St. Louis	16.00-16.50

RAILROAD SPECIALTIES

Chicago	18.50-19.00

LOW PHOSPHORUS

Buffalo, billet and bloom crops	19.50-20.50
Cleveland, billet, bloom crops	22.00-22.50
Eastern Pa., crops..	22.50-23.00
Pittsburgh, billet, bloom crops	21.50-22.00
Pittsburgh, sheet bar crops	20.50-21.00

FROGS, SWITCHES

Chicago	13.75-14.25
St. Louis, cut	15.50-16.00

SHOVELING STEEL

Federal, Ill.	13.00-13.50
Granite City, Ill....	13.00-13.50
Toronto, dealers....	10.00

RAILROAD WROUGHT

Birmingham	13.50-14.00
Boston district ....†	10.00-10.25
Buffalo, No. 1	13.00-13.50
Buffalo, No. 2	16.00-16.50
Chicago, No. 1 net..	12.50-13.00
Cincinnati, No. 2 ...	12.50-13.00
Eastern Pa., No. 1..	16.50-17.00
St. Louis, No. 1....	10.00-10.50
St. Louis, No. 2....	15.00-15.50
Toronto, No. 1 dlr...	16.00

SPECIFICATION PIPE

Eastern Pa.	15.50-16.00
New York .....†	11.50-12.00

BUSHELING

Buffalo, No. 1	14.00-14.50
Chicago, No. 1.....	13.00-13.50
Cincin., No. 1, deal..	12.00-12.50
Cincinnati, No. 2 ...	7.00- 7.50
Cleveland, No. 2...	10.50-11.00
Detroit, No. 1, new.	13.00-13.50
Valleys, new, No. 1	15.25-15.75
Toronto, dealers....	9.00

MACHINE TURNINGS

Birmingham	6.00- 7.00
Buffalo	10.00-10.50
Chicago	9.50-10.00
Cincinnati, dealers..	8.50- 9.00
Cleveland	10.00-10.50
Detroit	8.00- 8.50
Eastern Pa.	11.00-11.50
New York	†8.00- 8.50
Pittsburgh	10.50-11.00
St. Louis	8.00- 8.50
Toronto, dealers	8.00- 8.50
Valleys	12.75-13.25

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†7.00
Buffalo	9.50-10.00
Cincinnati, dealers..	7.00- 7.50
Cleveland	11.50-12.00
Detroit	9.00- 9.50
Eastern Pa.	10.00-10.50
New York	†7.00- 7.50
Pittsburgh	12.00-12.50
Toronto, dealers....	8.00- 8.50

CAST IRON BORINGS

Birmingham	8.00
Boston dist. chem...	†8.50
Bos. dist. for mills	†8.00
Buffalo	9.50-10.00
Chicago	9.50-10.00
Cincinnati, dealers..	7.00- 7.50
Cleveland	11.50-12.00
Detroit	9.00- 9.50
E. Pa., chemical....	14.50-15.00
New York	†7.50- 8.00
St. Louis	8.00- 8.50
Toronto, dealers....	9.00

PIPE AND FLUES

Cincinnati, dealers..	8.50- 9.00
Chicago, net	10.50-11.00

RAILROAD GRATE BARS

Buffalo	10.50-11.00
Chicago, net	9.50-10.00
Cincinnati	8.50- 9.00
Eastern Pa.	14.00-14.50
New York .....†	10.50-11.00
St. Louis	11.00-11.25

FORGE FLASHINGS

Boston district	†9.75
Buffalo	14.00-14.50
Cleveland	15.50-16.00
Detroit	12.00-12.50
Pittsburgh	15.00-15.50

FORGE SCRAP

Boston district	†8.50
Chicago, heavy	18.50-19.00

ARCH BARS, TRANSOMS

St. Louis	17.00-17.50

AXLE TURNINGS

Boston district	†9.00
Buffalo	14.00-14.50
Chicago, elec. fur...	14.00-14.50
Eastern Pa.	14.00-14.50
St. Louis	11.00-11.50
Toronto	9.50

STEEL CAR AXLES

Birmingham	19.00-20.00
Buffalo	19.25-20.25
Boston district ...	†19.00
Chicago, net	22.00-22.50
Eastern Pa.	24.00-24.50
St. Louis	19.50-20.00

SHAFTING

Boston district	†17.00
New York .....†	17.50-18.00
Eastern Pa.	23.00
St. Louis	18.00-18.50

CAR WHEELS

Birmingham	17.00-18.00
Boston dist., iron...	†12.50
Buffalo, steel	18.50-19.00
Chicago, iron	16.50-17.00
Chicago, rolled steel	16.50-17.00
Cincinnati, iron	16.50-17.00
Eastern Pa., iron..	19.00-19.50
Eastern Pa., steel..	22.50-23.00
Pittsburgh, iron	17.00-17.50
Pittsburgh, steel....	20.50-21.00
St. Louis, iron	17.00-17.50
St. Louis, steel....	19.00-19.50

NO. 1 CAST SCRAP

Birmingham	15.50-16.00
Boston, No. 1 mach.	†13.00
N. Eng. del. No. 2..	14.00-14.50
N. Eng. del. textile.	17.00
Buffalo, cupola	14.50-15.00
Buffalo, mach.	15.50-16.00
Chicago, agri. net..	11.50-12.00
Chicago, auto	12.50-13.00
Chicago, railr'd net	12.50-13.00
Chicago, mach. net	13.50-14.00
Cincin., mach. cup...	13.00-13.50
Cleveland, mach...	18.50-19.00
Eastern Pa., cupola	18.50-19.00
E. Pa., mixed yard.	15.00-15.50
Pittsburgh, cupola..	17.50-18.00
San Francisco, del..	13.50-14.00
Seattle	8.00- 9.00
St. Louis, No. 1....	12.75-13.25
St. L., No. 1, mach.	13.75-14.25
Toronto, No. 1, mach., net	14.00-15.00

HEAVY CAST

Boston dist. break..	†11.50
N. Eng. del.	14.75
Buffalo, break.	13.50-14.00
Cleveland, break. ..	16.00-17.00
Detroit, break.	12.50-13.00
Detroit, auto net...	13.50-14.00
Eastern Pa.	16.50-17.00
New York, break...	†13.00-13.50
Pittsburgh	14.75-15.25

MALLEABLE

Birmingham, R. R.	12.50-13.50
New England, del...	18.00
Buffalo	16.50-17.00
Chicago, R. R.	16.00-16.50
Cincin., agri. del....	13.00-13.50
Cleveland, rail	17.00-17.50
Detroit, auto	13.50-14.00
Eatsern Pa., R. R..	18.00
Pittsburgh, rail	17.00-17.50
St. Louis, R. R.	15.00-15.50

RAILS FOR ROLLING

5 feet and over

Birmingham	17.00-18.00
Boston	†12.50
Chicago	16.50-17.00
Eastern Pa.	19.50-20.00
New York .....†	16.00-16.50
St. Louis	17.00-17.50

LOCOMOTIVE TIRES

Chicago (cut)	18.50-19.00
St. Louis, No. 1....	17.00-17.50

LOW PHOS. PUNCHINGS

Buffalo	20.00-20.50
Chicago	17.50-18.00
Eastern Pa.	23.00-23.50
Pittsburgh (heavy)	20.75-21.25
Pittsburgh (light)..	20.00-20.50

Iron Ore

Lake Superior Ore

Gross ton, 51½%

Lower Lake Ports

Old range bessemer.....	$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-10.00
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, f.a.s. Atlantic

Foreign manganiferous ore. 45.55% iron, 6-10% man. nom.	13.00-14.00
No. Afr. low phos. nom.	18.00-20.00
Swedish low phos.	nominal
Spanish No. Africa basic, 50 to 60% nom.	15.00
Tungsten, Nov.-Dec. sh. ton, unit, duty pd.	nominal
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f..	$25.50-26.50

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52%..	non. 50.00
So. African, 50-52%	non. 50.00
Indian, 50-52%	Nominal

Sheets

Sheet Prices, Page 80

Pittsburgh — Sheet specifications have been lighter recently, the past week falling below the previous week and the month to date lagging behind the comparable part of September. Automotive specifications have helped cushion the drop this month, and as a result, sheet mills are slightly better off than mills confined to some other products. Buying by automakers is spotty, however, and it is due to a dearth of this business that the past week has been poor. Among other consuming industries, refrigerator and stove manufacturers are active, but in general, miscellaneous consumers are ordering on a hand-to-mouth basis. Demand for galvanized continues fair. Common and full finished mills on the national scale are operating around 66 to 67 per cent; galvanized mills at 69 to 70 per cent.

Cleveland—Sheet deliveries of one to two weeks on standard material are still obtainable from most sellers, despite the fact operations have been curtailed and a moderate improvement in specifications is noted. Consumers are still cutting down inventories before making further commitments. Local suppliers serving the auto trade have been hard hit, due to production difficulties by Ford on new models. Leading producer here has followed Carnegie's lead in announcing prices extended unchanged into next quarter.

Chicago — With automotive demand disappointingly slow, the sheet market continues to drag. Other users show little improvement and new business fails to measure up to shipments. Two to three weeks generally represents the maximum required in delivery of any grade.

New York — Small fill-in orders constitute most current buying in sheets, with orders actually more numerous but involving a lower aggregate tonnage. Deliveries continue easier. Two weeks shipments on hot-rolled sheets are common, with two to three weeks the rule on cold-finished sheets. Galvanized sheets are available in three to four weeks.

Philadelphia — New business in steel sheets continues slow but releases by the automotive trade constitutes one of the bright spots. Body builders are more active but continuation or increases from the present pace, of course, are dependent upon how the public takes to the new offerings. Deliveries on galvanized sheets at three weeks show further improvement. The average on cold-rolled is around four weeks, on hot-rolled two to three and on hot-rolled annealed around three.

Cincinnati — Demand for sheets from the automotive industry shows only slight expansion so that total specifications are near the level of the previous three weeks. Ordering from many miscellaneous users is steady but lacks volume sufficient to raise rolling schedules above 60 per cent of capacity. District independents have reaffirmed prices for the first quarter.

St. Louis—Buying of sheets continues to lag, all classes of users apparently waiting for uncertainty to dissipate before making commitments. The most active item is galvanized, but volume is below expectations. Silo and small tank builders still account for liberal tonnages.

Birmingham, Ala. — Sheets continue to provide most business, although there has been some decline in new tonnage. Operations continue unabated on large backlogs.

Strip

Strip Prices, Page 81

Pittsburgh—Demand for hot and cold-rolled strip steel continues spotty from most consumers, including the automotive, electrical, hardware and specialty fields. Buyers during the past week showed no sign of abandoning their cautious stand until they find further clarification of the outlook. Hot and cold strip mills are operating around 56 per cent.

Cleveland — Sellers anticipate a gradual increase in miscellaneous requirements through the remainder of the month. Deliveries on most grades can now be made within a week to ten days. Small tool and electrical equipment manufacturers continue to specify, although most consumers still report substantial stocks.

Chicago—Strip demand continues slow. Automotive buying is light and while a steady upturn by motor car interests is expected, buying recently has been disappointing. Practically all users are adjusting purchases to early requirements since prompt delivery generally is available.

Boston—Incoming cold strip volume holds at the recent current slack rate with practically all orders for prompt delivery. Reaffirming of prices for next quarter has had no effect on buying, but in a few instances tonnage specified for December delivery has been deferred for shipment to January. Fill-in replacement buying continues to account for most business. This is especially true of the automobile trade.

Philadelphia — Little activity is noted in narrow strip, with deliveries extending not more than two weeks or so. Prices appear steady.

Birmingham, Ala. — Cotton ties, heretofore the backbone of the South's strip business, show a marked decline with the season well under way. Considerable business remains to be worked off, but current orders have declined materially in the past week or ten days.

Plates

Plate Prices, Page 80

Pittsburgh — Plate specifications continue without extensive change either way. On three maneuver boat hulls, derricks and framing for cabins for United States engineers at Louisville, Dravo Corp., Pittsburgh, submitted a low bid of $57,150, while Marietta Mfg. Co., Point Pleasant, W. Va., was second low with $60,400. The three boats will require 250 tons of steel and will be equipped with steel booms 48 feet in length. Railroad buying continues quiet. Barring the unforeseen and if profit rates are advanced, some carriers expect to spend next year about as much as they spent this year. If this is borne out, tonnage would, of course, be less, but still a satisfactory volume of business for mills. The reaffirmation of prices for first quarter may have some slight effect in delaying railroad specifications since last year in the fourth quarter the roads hurried to get on the books ahead of the price advance. Most of the problems for the railroads have been settled, except the requested rate advance.

Cleveland—Little improvement is noted in miscellaneous demand for plates and further curtailment in operations may be necessary. Deliveries remain firm.

Chicago — Plate shipments and backlogs reflect poor demand from railroads and structural fabricators. Consumption among tank fabricators and miscellaneous users is holding fairly well although there has been no improvement recently.

Philadelphia—Current dullness in steel plates is indicated by the fact that some rolling schedules are down to three days a week. Sellers report most business is from tank and boiler shops. Demand from structural fabricating shops is extremely thin.

Philadelphia Shipbuilding Co. has

taken over the old Merchant's Shipyard which closed at the conclusion of the World war but no activity is reported as yet. Considerable exaggerated publicity in local newspapers has been given the announcement that the Hess Welded Ship & Barge Co. has taken space in the long-idle Cramp yards here. The company is welding one barge for the Pan-American Oil Co. from prefabricated plates, in which about 100 tons were involved. According to trade reports, neither yard is equipped to handle any of the anticipated government-financed ship work.

Birmingham, Ala. — Because of failure of specifications to materialize on several large projects, business in plates is lagging. It is evident, however, a pick up cannot be far in the offing with construction due to get under way immediately on contracts for which this material is intended.

San Francisco — Interest in the plate market centers around the outcome of close to 1000 tons for a 60-inch welded steel pipe line for San Francisco, bids on which have just been opened. Awards were confined to lots of less than 100 tons and little new work is in sight.

Seattle—While no important projects are pending three Washington cities are planning pipeline extensions. The Tacoma improvement will require about 600 tons of plates and an equal tonnage will be used in proposed jobs at Seattle and Bellingham.

Plate Contracts Placed

200 tons or more, hull repairs to Norwegian Motorship SOLOY; general contract to Burrard Drydock, Vancouver, B. C.

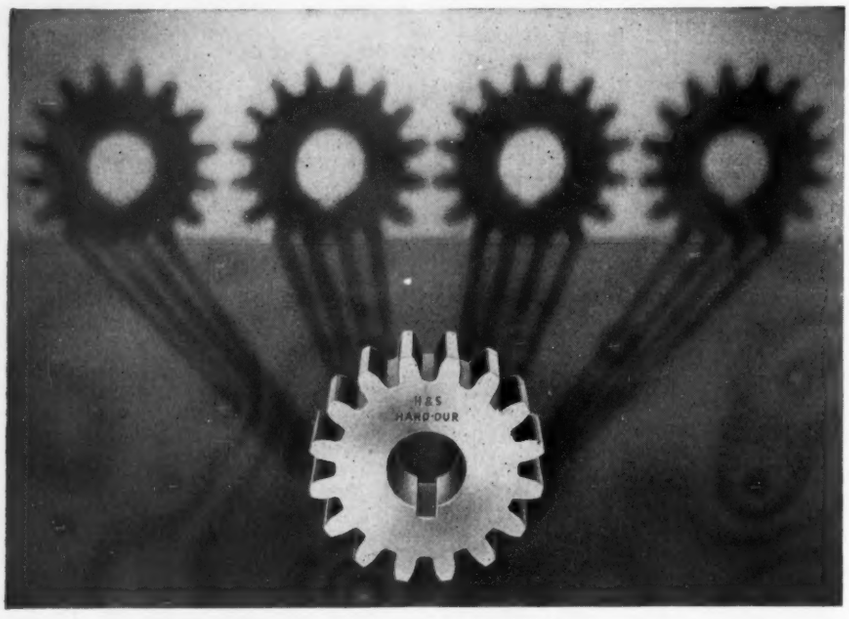
187 tons, three 120-inch and two 72-inch penstocks, power plant and outlet works, Seminoe dam, bureau of reclamation, Denver, to Treadwell Construction Co., Midland, Pa., $22,176; specification No. 975-D; bids Oct. 8.

110 tons, sphere tank, Gulf Oil Corp., Philadelphia, to Chicago Bridge & Iron Co., Chicago.

Plate Contracts Pending

800 tons, inner lining and risers, tunnels and shafts, West Branch-Kensico tunnel, Delaware aqueduct, Putnam and Westchester counties, New York; bids Nov. 9, board of water supply, New York; three contracts, 322, 323 and 324.

250 tons, three maneuver boat hulls, derricks and framing for cabins, for federal engineers, Louisville, Ky.; Dravo Corp., Pittsburgh, low at $57,150. Marietta Mfg. Co., Point Pleasant, W. Va., second low at $60,400.



4 TIMES THE LIFE

at only 50 per cent extra . . .

"HARD-DUR" Gears preserve the tooth form. They are made only of the finest gear steels and are scientifically heat treated to obtain the maximum physical properties. They are so much stronger, harder and more wear-resistant than similar untreated gears that they are guaranteed to have four to five times the life at only 50 per cent extra in cost. "HARD-DUR" Gears handle the tough jobs on which ordinary gears fail and when used on the average job they last almost indefinitely. A trial will prove their superiority and economy.

A valuable 448 page Gear book will be sent on request.

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVENUE, CLEVELAND, OHIO, U. S. A.

Bars

Bar Prices, Page 80

Pittsburgh—As in other divisions of the steel industry, October demand for bars has been under expectations, but specifications in this district are running a little closer to last month's volume than are some other products. While so far this month incoming business is less than the September volume, the decline is small with some producers. Alloy bars continue more active, due largely to the automotive industry's requirements, and forging shops are moderately busy. One automobile manufacturer placed some hurry-up business last week, with strict orders that the material be expedited.

Cleveland—Producers are somewhat disappointed over recent requirements from farm implement and tractor manufacturers. Prices on cold-finished bars for first quarter, have been officially announced, unchanged from current levels on alloy and carbon grades. Deliveries on ordinary carbon steel bars can be made within a week to 10 days.

Chicago—Bar consumers continue to restrict purchases to early needs and delay in expansion in automotive use still is retarding shipments.

Consumption by farm equipment manufacturers is at a relatively high rate for this period but this industry is ordering for current use instead of for 90 days as was done earlier in the year. Bar production is restricted and backlogs are scant.

Boston—Henry Disston & Sons Inc., Philadelphia, has been awarded 109 tons of hot-rolled alloy steel bars for the Springfield, Mass., armory at 8.245c delivered, bids Oct. 7, schedule 36. A substantial tonnage of corrosion-resisting material is also out for estimates for the armory. Commercial steel carbon bar prices are extended through first quarter, but this has had no noticeable influence on buying, which is dull.

Philadelphia—Quick deliveries are available on both hot and cold-drawn bars, reflecting small amount of buying. Survey of forge shops has said to have been made by the government with the view of possibly placing some business in connection with rearmament.

Birmingham, Ala.—Bar demand has been distinctly disappointing and there is no indication of immediate revival unless manufacturers of agricultural implements enter the market soon.

Pipe

Pipe Prices, Page 81

Pittsburgh—One producer reports that decline in tubular goods specifications appears to be leveling off. Mills still anticipate the seasonal drop in inventories and the decline which customarily accompanies cold weather. Line pipe continues quiet, with small projects assuming increased importance in the absence of large jobs. One oil company bought 30 miles for export last week. No announcement has been made concerning tubular goods prices for the early part of 1938, the industry having gotten away from the quarterly system of price announcements.

Cleveland—Pipe distributors report little change in miscellaneous requirements out of stock. Shipments this month are expected to show a slight improvement over September as demand for industrial repairs and extensions continues important. Recent cast pipe inquiries include 148 tons for a water system for Bethesda, O.; bids Oct. 30.

Boston—Bids will be taken soon, probably within a month, on a large supply of cast iron pipe for a Cape Cod, Mass., water line extension, several thousand tons to be required ultimately. Contracts have been

— — — — a new and dependable source of supply for

Electric Welded Tubing

WITH an enviable reputation at stake for making the finest in seamless tubing, Ohio has entered the electric welded tubing field.

Highly prizing and zealously guarding this reputation you can rest assured that every foot of Ohio "Special Quality" electric welded tubing will be of uniform high quality.

Give "OHIO" a call when your needs require quick action and prompt deliveries.

The OHIO SEAMLESS TUBE CO.

OHIO SPECIAL QUALITY

Shelby, OHIO

SEAMLESS MECHANICAL TUBING . . . Carbon and Alloy Steels.

SEAMLESS PRESSURE TUBING . . . Boiler Tubes, Merchant and Locomotive, Heat Exchanger and Condenser Tubes in Plain Carbon, Special Alloy or Toncan Iron.

SEAMLESS AIRCRAFT TUBING . . . SAE 4130X and SAE 1025 to Government Specifications in "Ohio Special" Non-Oxidized Surface Finish.

ELECTRIC WELDED TUBING . . . For all Mechanical Purposes.

UPSETTING · FLANGING · TAPERING AND BENDING

"OHIO SPECIAL QUALITY"

placed for two projects taking 430 tons, but buying is generally for miscellaneous small lots.

New York — Cast pipe buying is light and in small lots. Foundry backlogs are lower with some decline in operations, although schedules covering flanged work and fittings are fairly well sustained. Cast pipe foundries are meeting increasing competition from a cement-asbestos pipe, the latter entering into World's fair work especially. Steel pipe is moving slowly, with 95,000 feet of steel pipe ranging up to 2½ inches in diameter for the local board of water supply outstanding. The board will take bids Nov. 9 on a Delaware aqueduct development, for which this pipe will be required.

Philadelphia—City of Philadelphia takes bids Oct. 26 on 750 tons of 24-inch pipe. Otherwise, little of interest is noted in the pipe trade.

Birmingham, Ala.—A decline in operations is reported by Birmingham plants which are hard put to maintain 45 per cent operations. No business of outstanding significance is in sight.

San Francisco—Cast iron pipe awards were the largest in over a month, totaling 742 tons, bringing aggregate for the year to 23,729 compared with 40,607 tons for the same period a year ago. Bids have just been taken on 338 tons of 16-inch pipe for San Diego, Calif.

Seattle—Water system improvements are planned by a number of cities but demand for cast iron pipe continues under normal. Provo, Utah, Bay Center and Tenino, Wash., are arranging finances for water system improvements. Ontario, Oreg., is planning a $75,000 project, and District No. 7, King county, Wash., has $80,000 available for rehabilitation, involving unstated tonnages of 4, 6 and 12-inch cast iron or steel pipe.

Cast Pipe Placed

505 tons, 4 to 10-inch, Class 150, Fresno, Calif., to United States Pipe & Foundry Co., Burlington, N. J.

280 tons, 6 and 10-inch, Westfield, Mass., to Warren Foundry & Pipe Co., Everett, Mass.

270 tons, 4, 6 and 8-inch for Portland, Oreg., to United States Pipe & Foundry Co., Burlington, N. J.

150 tons, 10-inch, Portsmouth, N. H., to R. D. Wood & Co., Florence, N. J.

100 tons, 6 and 8-inch for Vancouver, Wash., to Pacific States Cast Iron Pipe Co., Provo, Utah.

100 tons, 4 and 6-inch, Roseville, Calif., to United States Pipe & Foundry Co., Burlington, N. J.

Cast Pipe Pending

349 tons, 4 to 8-inch, Tucson, Ariz.; Pacific States Cast Iron Pipe Co., Provo, Utah, low.

150 tons, 4 to 8-inch, Sacramento, Calif.; United States Pipe & Foundry Co., Burlington, N. J., low.

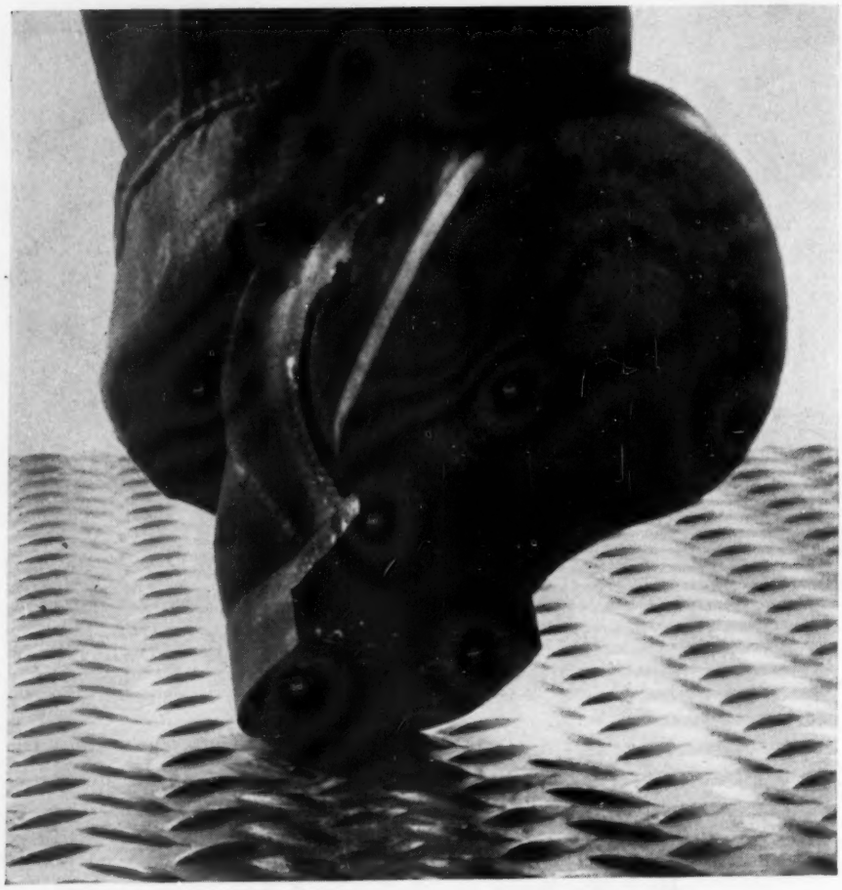
Unstated tonnage, 10,000 feet of 4 to 8-inch water pipe; Fond du Lac, Wis.; bids closed Oct. 2.

Unstated tonnage, waterworks system, Preble township, Brown county, Wis.; bids Oct. 28.

Unstated tonnage, 2200 feet of 8-inch and 2600 feet of 16-inch water mains, Milwaukee; bids closed Oct. 21.

Steel Pipe Pending

Unstated tonnage, 3000 feet, 24-inch o. d. pipe, state procurement officer, treasury department, New York, proposal 179,171, Oct. 25.



INLAND 4-WAY FLOOR PLATE

Means Safety Under Foot

Floors are part of production equipment of your plant. Men and materials must move over them constantly. Making them safe against the most common of plant accidents (falls over level surfaces) also speeds up production—increases efficiency. Write for Inland's new interesting booklet on how and where Inland 4-Way Floor Plate fits into new plant construction and old plant repair and modernization.

SHEETS • STRIP • TIN PLATE • BARS • PLATES • STRUCTURALS • PILING • RAILS AND ACCESSORIES

INLAND STEEL CO.

General Offices: 38 South Dearborn Street, Chicago, Illinois • Offices in: Detroit Kansas City Milwaukee St. Louis-St. Paul

Semifinished

Semifinished Prices, Page 81

Production and consumption of semifinished steel are off, in line with easier conditions throughout the entire industry. Finishing mills and nonintegrated consumers are much less active, and export bookings are below expectations, although there is still a fair volume of inquiry for billets, sheet bars

and other grades. On foreign business, prices have softened considerably and in some instances are well below domestic levels.

Wire

Wire Prices, Page 81

Cleveland—Producers of manufacturers' and merchant wire products are generally expected to follow American Steel & Wire Co.'s lead in extending current prices into first quarter. Requirements of fencing and other merchant wire products from agricultural sources have failed to expand to expectations. Demand from auto partsmakers, while improved, is still well below former estimates.

Chicago — Manufacturers' wire demand continues slow, marked by a lag in automotive needs. An increase in wire consumption by motor car interests is expected shortly but the upturn has been delayed longer than usual. Stocks of most consumers are light, hence buying will respond to changes in requirements. Favorable reports on merchant wire demand are heard from a number of farm districts.

Boston—Wire buying is light, consumers continuing to work off stocks and buy for fill-in replacements. Such demand is widely diversified with prompt delivery specified. Finishing operations are also lower and spotty, although some producers of electrical goods are fairly active, with moderate backlogs.

Birmingham, Ala.—While demand for wire continues in somewhat better proportion to shipments, the expected revival in buying has not materialized. Dealer stocks are known to be low, but replacement orders have not been in the quantity expected.

Tin Plate

Tin Plate Prices, Page 80

Pittsburgh — Tin plate buyers, having taken all the contract plate they were entitled to, are using up the low-priced material before entering the market again. New specifications are light, but this had generally been looked for, October and November being customarily dull from this standpoint. None of the tin mill prices has been reaffirmed for 1938, the announcement for the ensuing year usually coming around Nov. 15. In some quarters it is said a slight delay on the anticipated announcement would not be unexpected. While the recent reaffirmation of semifinished

Dependable insulation helps control **TIME, TEMPERATURE,** *and* **ATMOSPHERE** *in this furnace for scale-free heat treating*

ACCURATE, uniform, scale-free results are assured in this chain belt conveyor furnace built by The Electric Furnace Company, Salem, Ohio. In its operation, Armstrong's N-16 and EF-22 Insulating Fire Brick help control temperature as well as atmosphere for scale-free heat treating and clean and bright hardening. These efficient brick assure more uniform temperatures, lower fuel costs, and increased production in furnaces and heating equipment of all types.

Low conductivity has been the first consideration in the manufacture of Armstrong's entire line of Insulating Fire Brick. And the extremely high crushing strength of these brick make them suitable for any type of design without sacrificing thermal efficiency. Furthermore, each brick is ideally adapted for the service recommended. Light in weight, structurally strong, their high insulating efficiency is due to the fine cellular composition which is produced by burning out finely ground cork particles.

Armstrong's complete line of Insulating Fire Brick includes five types. Armstrong's N-16, N-20, and A-25, are *light duty* brick for temperatures up to 1600°, 2000°, and 2500°, F., respectively. They are generally used as a backing up brick, but may also be used as a refractory lining when heavy service is not required. Armstrong's EF-22 and EF-26 are *heavy duty* brick and may be used in direct exposure for temperatures up to 2200° and 2600° F., respectively. For full information, samples, and prices, write Armstrong Cork Products Co., Building Materials Div., 985 Concord St., Lancaster, Pennsylvania.

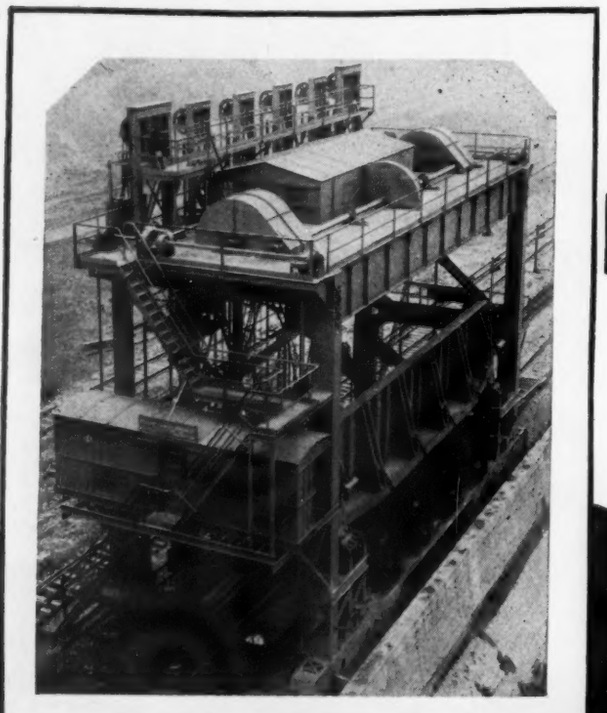
Armstrong's

HIGH TEMPERATURE INSULATION

steel and other prices may have effect on the quotation to be set, there are no indications at this time as to just what the 1938 price will be. From the producers' standpoint, tin plate has not been highly profitable this year since realization of the $5.35 per base box, Pittsburgh, price did not come until late. By far the larger percentage of tin plate consumed this year has been at the old $4.85 price. Operations of the industry are estimated roughly at 85 per cent at this time.

New York — With most large consumers well stocked, domestic demand for tin plate is quiet. This lull is more pronounced than usual at this season, due to excess covering before contracts expired Sept. 30 at lower prices and to continued labor disturbances at canning plants. Export demand from Europe and South America is still brisk.

Shaler Co., manufacturer of hot patches, tube vulcanizers, etc., has recently removed its executive offices from Milwaukee to Waupun, Wis.



Car Dumpers

All types—Movable, Revolving, Turnover, Stationary.

Creative ENGINEERING...

When faced with unprecedented problems in material handling—consult Wellman. Our engineers are accustomed to creating machinery to perform new functions.

MATERIAL HANDLING EQUIPMENT

WELLMAN PRODUCTS INCLUDE: Steel Mill Equipment . . . Charging Machines, Cars and Boxes . . . Open Hearth Furnaces . . . Manipulators . . . Coal and Ore Handling Machinery . . . Clam Shell Buckets . . . Car Dumpers, all types . . . Blast Furnace Skip Hoists . . . Gas Producers, Valves and Flue Systems . . . Wellman-Galusha Clean Gas Generators . . . Gas Reversing Valves . . . Mining Machinery . . . Safety Stops for Traveling Structures . . . Welded Steel Construction . . . Castings and Machine Work to customers' drawings.

The WELLMAN Engineering Co.
ENGINEERS · CONSTRUCTORS · MANUFACTURERS
CLEVELAND, OHIO.

Transportation

Track Material Prices, Page 81

Interstate commerce commission Friday handed down a decision granting increases on basic commodities as asked by the carriers, almost to the full extent of the request. It is estimated that the increases will provide about $47,500,000 annually in increased revenues, which should allow buying of at least some of the rails and rolling stock needed.

Whether equipment buying will respond to the favorable decision on the basic commodity rates is problematical, particularly since prospects for heavier traffic have been dimmed by the current recession in general business and by the failure of freight volume to measure up to previous expectations. Orders for track accessories and for miscellaneous steel and repair work are fairly steady but light. Inquiries for 1938 rail requirements have not been issued. Moderate tonnages of structural material are pending and in prospect for railroad bridge repairs.

The Pennsylvania has withdrawn its inquiry for 19 lightweight streamlined coaches, which has been pending since early in September.

Car Orders Placed

Barrett Co. fifteen 6000-gallon tank cars, to General American Tank Car Corp., Chicago.

Shapes

Structural Shape Prices, Page 80

New York — Taking 10,770 tons of structural material, six shafts and tunnels, Putnam and Westchester counties, closing Nov. 9 with the board of water supply, New York, are outstanding in structural inquiry. Awards have slumped, 1177 tons for school additions, Brooklyn, being included.

Pittsburgh — Although jobs over 1000 tons are not numerous, awards and inquiries for structural shapes have been well maintained recently. Largest inquiry is for an office building for the state of Pennsylvania at Harrisburg. Bridge awards have been numerous recently.

Cleveland — Pennsylvania railroad's three to four million dollar expansion program at its Sandusky, O., unloading dock, has stirred considerable interest here. The project will require 4586 tons of sheet piling, 525 tons of H piles, 375 tons of reinforcing and approximately 1000 tons of structural steel for an un-

loader. Bids on the unloader went in late last month but bids on the other material were due Oct. 25. Other inquiries are limited to comparatively small tonnage. Prices remain firm.

Chicago—Fabricators are figuring on a number of small jobs, but pending work remains at a low level. Awards also are light and include few large projects. Financing difficulties have caused the postponement of bids on the Sioux City, Iowa, bridge involving 2400 tons.

Boston — The Calvin Coolidge Memorial bridge, Connecticut river, Northampton-Hadley, Mass., is the leading new inquiry. Structural awards are lower, confined mostly to small-tonnage contracts. A fair volume of work is being estimated and a few shops have moderately large backlogs.

Philadelphia — New shape business grows more restricted. Some fabricating shops report average operations estimated under 50 per cent.

Seattle—Business is fair with fabricating plants, some of which have sufficient backlog to carry to the end of the quarter. Belmont Iron Works, Eddystone, Pa., low bidder, is reported to have been awarded 810 tons for the Sand Point, Seattle, naval hangar.

Shape Contracts Placed

1600 tons, Panama, schedule 3292, to U. S. Steel Products Co., Washington; bids Oct. 18. Material is for pier structure, Cristobal, Canal Zone, delivery.

1200 tons, apartment, 100 Riverside drive, New York, to Lehigh Structural Steel Co., Allentown, Pa.; through Simon Brothers Builders, New York.

1177 tons, additions, Manual training high school, Brooklyn, N. Y., to Lehigh Structural Steel Co., Allentown, Pa., at $111,509; bids Oct. 11, board of education, New York, steel work direct, fabricating and erecting.

1000 tons, apartment, 964 Fifth avenue, New York, to Lehigh Structural Steel Co., Allentown, Pa.; through Simons Brothers Builders, New York.

900 tons, garage, for department of sanitation, Bergen Landing, Queens, N. Y., to Dreier Structural Steel Co., New York; through Stock Construction Co., New York.

740 tons, warehouse and factory building, Sealed Power Corp., Muskegon Heights, Mich., to R. C. Mahon Co., Detroit.

600 tons, state highway underpass WPGM—415, Denver, to Bethlehem Steel Corp., Bethlehem, Pa.

470 tons, warehouse and store, S. H. Kress Co., El Paso, Tex., to Austin Bros., Dallas, Tex.; R. E. McKee, El Paso, contractor and engineer.

420 tons, paper mill, Fernandina Pulp & Paper Co., Fernandina, Fla., to Southern Steel Works Co., Birmingham, Ala.

315 tons, overpasses, Hampton-Beaufort county, South Carolina, to Minneapolis Moline Power Implement Co., Minneapolis.

250 tons, shapes and bars, state highway bridge, contract B-1575, Indiana, to Central States Bridge Co., and W. J. Holliday & Co., Indianapolis; through Clark & Duvall, Flora, Ind.

203 tons, shapes and steel bearing piles, bridge, over Hockanum river, East Hartford, Conn., to American Bridge Co., and Carnegie-Illinois Steel Corp., Pittsburgh; through A. I. Savin Construction Co., East Hartford.

200 tons, state highway bridge over Arkansas river, Parkdale, Colo., to Midwest Steel & Iron Co., Denver.

190 tons, alterations to manufacturing building, E. I. DuPont de Nemours & Co., Ft. Madison, Iowa, to Bethlehem Steel Corp., Bethlehem, Pa.

170 tons, power house, Hercules Powder Co., Brunswick, Ga., to Morris-Wheeler Co., Philadelphia.

160 tons, state highway bridge, San Marcial, N. Mex., to Darbyshire-Harvie Co., El Paso, Tex.

160 tons, All Saints roman catholic

Shape Awards Compared

	Tons
Week ended Oct. 23	**11,255**
Week ended Oct. 16	**32,454**
Week ended Oct. 9	**10,845**
This week, 1936	**20,380**
Weekly average, 1936	**16,332**
Weekly average, 1937	**24,375**
Weekly average, September	**18,073**
Total to date, 1936	**963,039**
Total to date, 1937	**1,048,118**

Includes awards of 100 tons or more.

THIS JOB IS *A NATURAL* FOR STARRETT SHOP EQUIPMENT TOOLS

YOU CAN GUESS how much inspection work it takes before this baby gets a final O.K. This shop makes every measurement with Starrett Tools. The men have confidence. They work better and *faster*. And costly dies are rarely spoiled.

A PERFECT FIT! Layed out, produced and inspected with the aid of Starrett Tools, dies like this come through well within close limits. Shops that do this kind of work almost invariably specify Starrett when they buy Precision Shop Equipment Tools.

WRITE for Revised Starrett Catalog No. 25 F It describes the complete line of Starrett Precision Tools.

THE L. S. STARRETT CO., ATHOL, MASS., U. S. A.

World's Greatest Toolmakers—Manufacturers of Hacksaws Unexcelled—Steel Tapes, Standard for Accuracy Dial Indicators for Every Requirement

Standardize on STARRETT TOOLS

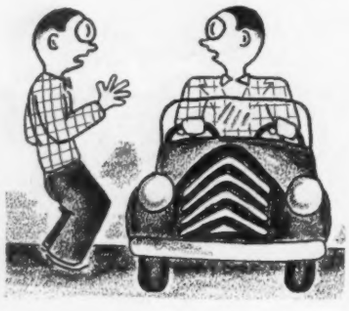
BUY THROUGH YOUR DISTRIBUTOR

Behind the Scenes with STEEL

Metalnastics

BROWSING and sowsing around the metal show last week we discovered an astounding number of things we had not dreamed of before. An epoch-making development in convention technical sessions was the installation of a varied assortment of plain and fancy lounge chairs for listeners. Stretched out in one of these comfortable affairs, you could lean back and examine the large colored signs of the zodiac painted on the ceiling and, lulled by the droning voice of the speaker, the soft lights and distant musing of a pipe organ, it was all too easy to drift off to slumber. In fact Ray Bayless of the A.S.M. staff reported the only disturbing note at some of the sessions was the rumbling of snores of listeners who had succumbed. He was kept busy tapping them back to consciousness.

TWO lifelike dummies in wax at the booth of Harnischfeger Corp.—one driving an automobile with two steering wheels,



and the other popping away at an electric welder—caught this observer totally unaware. We walked up to one of the boys, held out our hand and said, "Hello, Joe," before we realized he was only a stooge.

THE marionette show, central feature of the breath-taking exhibit staged (literally and figuratively) by USSteel Corp., caught the attention of many. We couldn't stop to witness it as we had to see a man about scale-free hardening a 50-cent piece for us, but one of our snoopers reported there were seven operatives concealed in the small booth manipulating Tony Sarg's marionettes. Two above and five below, our spy said. Bet they were uncomfortable.

BOARDWALK habitues were scratching their noggins over GE's traveling sign at the outer end of the million-dollar (now marked down to $500,000) pier with its repeated invitation to "watch scale-free hardening done continuously — see full - range quality welding sets, etc." One doughty old dowager told us she was bothered with scale-free hardening of her arteries, and could General Electric help her. We gave her wheelchair a push and when last seen she was screaming away full tilt into the ebb tide.

• • •

Anxious

REALLY in a fine hurry is a Jersey City supporter who wrote us last week:

"I enclose my check for $1.00 in payment for a copy of your 1938 Yearbook of Industry. Mail same to above address when issued if not already printed and oblige."

STEEL's 1938 Yearbook is now in the brains of all staff members only, and unfortunately it cannot be circulated in that form This boy will just have to wait until January 3, 1938 for his copy. We will assure him that when he does see it, he will be more than happy because it will be the most beautiful ever, with its usual excellent editorial job perfected and augmented by several new features. Better check up to be sure you will receive yours. They go free to all regular subscribers, so be there when the snow flies and you'll learn all about industry for 1937 and what will come in 1938.

—SHRDLU

church, Buffalo, to Buffalo Structural Steel Corp., Buffalo.

165 tons, plant extension, for General Electric Co., Decatur, Ill., to International Steel Co., Evansville, Ind.

155 tons, batch equipment building, Owens-Illinois Co., Newark, O., to Pittsburgh Bridge & Iron Co., Pittsburgh.

150 tons, state highway bridge No. 242-1, Elma Center, N. Y., to Lackawanna Steel Construction Corp., Buffalo.

140 tons, perishable shed, Louisville & Nashville railroad, Cincinnati, to Bedford Foundry & Machine Co., Bedford, Ind.

130 tons, bridge No. 459-A/1, Baltimore & Ohio railroad, Cleveland, to Bethlehem Steel Corp., Bethlehem, Pa.

130 tons, footings and towers, Schuylkill river crossing, Pennsylvania railroad, Harrisburg, Pa., to Belmont Iron Works, Eddystone, Pa.

120 tons, crusher building, Hiwassee dam, Tennessee Valley Authority, Turtletown, Tenn., to Johnson City Foundry & Machine Co., Johnson City, Tenn.

110 tons, Bichromate plant, Imperial Paper Color Corp., Rochester, N. Y., to James McKinney & Sons, Rochester.

100 tons, shapes and bars, state bridges, Wells and York, Me., to Bethlehem Steel Corp., Bethlehem, Pa.; Stewart & Williams, Inc., Augusta, Me., general contractor.

100 tons, residence, for L. J. Rosenwald, to Morris-Wheeler Co., Philadelphia.

100 tons, bridge, Bucks county, Pennsylvania, to Bethlehem Steel Corp., Bethlehem, Pa.

100 tons, building, Bailey Meter Co., Cleveland, to Rogers Structural Steel Co., Corry, Pa.

Shape Contracts Pending

10,770 tons, shafts and tunnels, West Branch-Kensico tunnel, Delaware aqueduct; bids Nov. 9, board of water supply, New York; work includes shafts 11 and 12 and about 33,400 feet of tunnel, Carmel, Somers, North Salem and Lewisboro, N. Y., contract 322; shafts 13 and 15 with 30,600 foot tunnel, Bedford and Lewisboro, N. Y., contract 323; shafts 15 and 16 with 37,100 feet tunnel, North Castel and Bedford, N. Y., contract 324. Tunnel will be circular with 15-foot diameter within concrete lining. Contract 322 also takes 238 tons, steel sheet piling. Other steel requirements for this work appear under contract pending columns, this section, STEEL.

5000 tons, North office building No. 2, Harrisburg, Pa., for state of Pennsylvania.

4586 tons, sheet piling, expansion project at the Pennsylvania railroad's unloading dock, Sandusky, O.; bids Oct. 25. Also includes 525 tons of H piles, 375 tons of bars. Award for an unloader for the same project, involving 1000 tons of shapes, is still pending.

3600 tons, blast furnace, for Ford Motor Co., Detroit; Arthur G. McKee Co., Cleveland, engineers.

3000 tons, Calvin Coolidge Memorial steel deck truss bridge and approaches, Connecticut river, Northampton-Hadley, Mass., F. A. No. 193-B, bids Nov. 2, department of public works, Boston, G. H. Delano, chief engineer.

2400 tons, Missouri river bridge, Sioux City, Iowa; bids scheduled for Oct. 25 postponed.

1100 tons, two buildings, Armstrong Cork & Linoleum Co., Lancaster, Pa.; bids in.

1060 tons, viaduct and roadway, East 135th street and Lincoln avenue, Bronx, N. Y.; bids Oct. 28, borough president, Bronx.

700 tons, shapes and bars, buildings,

Abingdon research station, department of agriculture, Arlington county, Virginia; McCloskey Co., Philadelphia, low.

670 tons, plate girder bridge, Bucks county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Oct. 29.

625 tons, warehouse, Oahu railroad, T. H.; bids opened.

610 tons, 10-span I-beam bridge over Erie & Buffalo and Susquehanna & Western railroads, Chautauqua county, New York; Bero Engineering & Construction Corp., North Tonawanda, N. Y., contract at $269,101.50, bids Oct 14, department of public works, Albany.

600 tons, also 100 tons bars, state highway bridge, Bucks county, Pennsylvania; bids Oct. 29.

596 tons, bridge, Ottumwa, Iowa.

530 tons, supports, Everett, Mass., for Standard Oil Co. of New Jersey.

500 tons, bridge, Kingsport, Tenn.

500 tons, framing, gates, etc., Bonneville project; bids in.

500 tons, post office and court house, Amarillo, Tex.; bids Nov. 25, public buildings branch, treasury department, Washington.

450 tons, including machinery, Skagit river state bridge; bids at Olympia, Wash., Nov. 2.

450 tons, cyanide sand plant No. 1, Homestake Mining Co., Lead, S. Dak.

360 tons, state highway bridge, Sloansville, Schoharie county, N. Y., Lane Construction Co., Meriden, Conn., contract at $173,109, bids Oct. 14, department of public works, Albany.

240 tons, bridge, Adams county, Ohio; bids Nov. 9.

230 tons, gymnasium addition, baseball cage, University of New Hampshire, Durham, N. H.

230 tons, building, Sisters of St. Joseph, Englewood Cliffs, N. J.

200 tons, Montgomery county hospital, Norristown, Pa., Balinger & Co., Philadelphia, architect; bids Nov. 4.

200 tons, alterations, power house, Bellevue hospital, New York; bids Oct. 27.

170 tons, addition to Delaware Trust building, Delaware Land Development Co., Wilmington, Del.

170 tons, steelwork for battery "C", Ford Motor Co., Dearborn, Mich.

150 tons, bascule bridge, Mantoloking, N. J.; bids Oct. 27.

120 tons, two state highway bridges, project 2003-B, unit 3, Ridgway, Colo.

110 tons, bridge, Stickney avenue, Toledo, O., for Lucas county, Ohio.

110 tons, suspension foot bridge over Little Fork river, Cass Lake, Minn., U. S. department of interior.

108 tons crossing, Livingston, Merced county, California, bids soon.

100 tons, shapes, bars and miscellaneous steel approach Lincoln tunnel, North Bergen and Union city, N. J.; bids Nov. 16, port of New York authority, contract MHT-70.

Unstated, fish lifts, machinery and miscellaneous; bids at Bonneville, Nov. 9.

Unstated, main central tunnel gates; bids at Ft. Peck, Mont., Dec. 3.

Reinforcing

Reinforcing Bar Prices, Page 81

New York — With reinforcing tonnage contracts lower, inquiry has stepped upward. Bids close this week on 1900 tons, Queens sewer, and 1125 tons, Weehawken, N. J., approach, Lincoln tunnel. While reinforcing prices are slightly firmer, they will be severely tested on work being figured.

Pittsburgh—With colder weather imminent, projects have been coming out well recently. Inquiry includes 1100 tons for a state highway bridge in Ballard county, Kentucky.

Cleveland—Awards are confined to small tonnages for plant extensions and in conjunction with structurals in state bridge work. Mills are able to make deliveries within three to four days and in some instances sooner. Inquiries include 375 tons for a retaining wall for Pennsylvania railroad's unloading dock at Sandusky, O., and 700 tons, service building and underground tunnel, for F. & R. Lazares & Co., Columbus, O.

Boston — Three projects, bridge, Northampton, Mass.; fish pier buildings, Gloucester, Mass., and the Deer Isle, Me., suspension bridge foundation, account for the bulk of approximately 2000 tons of reinforcing steel active in New England.

"BIG STEEL and LITTLE STEEL"
USE
WHITCOMB LOCOMOTIVES

● Because of our complete line, Whitcomb engineers give impartial recommendations as to the size and type of power best suited to your plant layout and your product.

In a Whitcomb Locomotive you get the finest of engineering—Whitcomb Mechanical or Electric Transmission, Whitcomb Clutch, Whitcomb Unit or Built-up Steel Frame, Whitcomb Cross Equalizer and other features, all designed specially for locomotive use and based on our 31 years of experience as America's foremost builders of industrial locomotives.

Let our engineers survey your haulage problems and point out the savings you can make with Whitcomb equipment.

THE WHITCOMB LOCOMOTIVE CO.
Plant at Rochelle, Illinois
Subsidiary of The Baldwin Locomotive Works. All Sales made by The Baldwin Locomotive Works, Paschall Station Post Office, Philadelphia, Pennsylvania.

Choose Your Power

Gasoline or Diesel Mechanical Drive
Gasoline or Diesel Electric Drive
Electric Storage Battery
Electric Trolley
Combination Trolley—Storage Battery

Most current orders are small, with highway buying down sharply.

Chicago — While inquiries are confined to small lots, a moderate tonnage is pending, and shipments are fairly active. Additional bar business is in prospect for state roads and bridges and Chicago sanitary district sewers.

Philadelphia — A further softening tendency is noted on prices for fabricated concrete bars. Some shops still have a fair tonnage bought prior to the price advance early this year. State of Pennsylvania will take bids Oct. 29 on several hundred tons of mesh for road jobs.

San Francisco—The largest award of the week called for 250 tons for an addition to the Federal jail in Los Angeles. The bureau of reclamation has opened bids on 1900 tons for delivery at Knob and Calexico, Calif. Awards for the week totaled 1022 tons and brought the aggregate for the year to 81,818 tons, compared with 204,028 tons last year.

Seattle — Rolling mill operations are the lowest in a year. Backlogs have been cleaned up, only small tonnages being rolled. Tonnages pending are of small proportions.

Unit Steel Bids, Suspension Bridge, Deer Isle-Sedgwick, Me.

Tenders Octobr 2, Robinson & Stinman, New York, Consulting Engineers

Material	Unit	A	B	C	D
Structural carbon steel in superstructure, floors, lbs.	1,770,000	$0.084	$0.087	$0.0865	$0.0882
Structural carbon steel in main towers, lbs.	820,000	0.093	0.1075	0.0955	0.0953
Structural carbon steel in viaduct, lbs.	283,000	0.089	0.10	0.0905	0.096
Structural carbon steel in cable bent towers, lbs.	40,000	0.102	0.116	0.091	0.12
Cast steel and forgings, lbs.	83,550	0.20	0.195	0.405	0.34
High tensioin bolts, lbs.	4,400	0.23	0.14	0.2513	0.16
Anchorage steel and supports, not erected, lbs.	92,000	0.076	0.105	0.08	0.061
Main cable strand, lbs.	428,000	0.20	0.21	0.2391	0.23
Suspender rope, steel, lin. ft.	15,000	0.90	1.00	1.02	1.30
Roadway deck, suspension bridge, sq. ft.	42,150	1.05	1.07	1.10	1.30
Reinf. steel, viaduct deck, lbs.	42,000	0.07	0.065	0.0788	0.064
Pipe and fittings in viaduct railing, lbs.	4,600	0.14	0.15	0.1807	0.14
No. O, A. W. G. Armortite bridge cable, lin. ft.	1,460	0.43	0.50	0.40	0.50
No. 2, same bridge cable, lin. ft.	2,160	0.36	0.39	0.30	0.37
No. 4, same cable, lin. ft.	1,230	0.32	0.33	0.25	0.41
No. 10, same cable, lin. ft.	2,550	0.26	0.28	0.15	0.30

A—Phoenix Bridge Co., Phoenixville, Pa., contract, at $459,850; B—John A. Roebling's Sons Co., Trenton, N. J., second, $579,549; C—American Bridge Co., Pittsburgh, third, $489,175; D—Bethlehem Steel Co., Bethlehem, Pa., $493,030. Engineer's estimate, $465,000.

CROSBY FOR STAMPINGS

ALL our efforts have been concentrated on one product—STAMPINGS—for 40 years. We have made stampings, deep, intricate, heavy, light, large and small, for nearly every branch of industry.

Stamping Specialists Since 1896

An Experience You Should Not Overlook
Send Us Your Next Specification

THE CROSBY COMPANY

BUFFALO, N. Y.

NEW YORK — CHICAGO — PHILADELPHIA — DETROIT — CLEVELAND

Reinforcing Steel Awards

500 tons, bars and shapes, apartment project, University Housing Corp., Durham, N. C., to Truscon Steel Co., Youngstown, O., and Carolina Steel & Iron Co., Greensboro, N. C.; T. A. Loving, Goldsboro, N. C., general contractor.

305 tons, grading and paving, Henry Hudson bridge, New York, from bridge to West 239th street, to Fireproof Products Co., New York; Arthur Gallow Co., Bronx, N. Y., general contractor.

250 tons, addition, Federal jail, Los Angeles, to unnamed interest.

201 tons, crossing, Redmond, Alameda county, California, to Kyle & Co., Fresno, Calif.

200 tons, office building and stores, Du Pont interests, Miami, Fla., to Truscon Steel Co., Youngstown, O.; through G. A. Fuller Co., New York.

190 tons, exhibition building, state fair, Shreveport, La., to Sheffield Steel Corp., Kansas City, Mo.; A. J. Rife Construction Co., Dallas, Tex., general contractor.

175 tons, embassy building, apostolic delegation of Catholic church, Washington, to Rosslyn Steel & Cement Co., Rosslyn, Va.

160 tons, grade elimination, New York Central railroad, Belle Isle, N. Y., to Bethlehem Steel Corp., Bethlehem, Pa.

150 tons, addition St. Joseph hospital, Beaver Dam, Wis., to Bethlehem Steel Corp., Bethlehem, Pa.

130 tons, building, Pabst Brewing Co., Milwaukee, to Joseph T. Ryerson & Son Inc., Chicago.

125 tons, highway work, Chaffee county, Colorado, to unnamed interest.

110 tons, crossing, Thornton, Madison county, Idaho, to unnamed interest.

100 tons, first unit, State Teachers college, Shippensburg, Pa., to Sweets Steel Co., Williamsport, Pa.

100 tons, state highway project, WF-37-5, Queens, N. Y., to Concrete Steel Co., New York; through A. W. Bank Inc., Hastings, N. Y.

100 tons, warehouse and store, S. H. Kress Co., El Paso, Tex., to Truscon

Concrete Awards Compared

	Tons
Week ended Oct. 23	2,796
Week ended Oct. 16	8,958
Week ended Oct. 9	2,778
This week, 1936	2,336
Weekly average, 1936	6,005
Weekly average, 1937	6,260
Weekly average, September	8,084
Total to date, 1936	293,462
Total to date, 1937	269,199

Includes awards of 100 tons or more.

Steel Co., Youngstown, O.; R. E. McKee, El Paso, contractor and engineer.

Reinforcing Steel Pending

1100 tons, state highway bridge, Ballard county, Kentucky.

800 tons, Calvin Coolidge Memorial bridge and approaches, Connecticut river, Northampton-Hadley, Mass.; bids Nov. 2, department of public works, Boston, G. H. Delano, chief engineer.

785 tons, shafts and tunnels, West Branch-Kensico section, Delaware aqueduct, Putnam and Westchester counties, New York; bids Nov. 9, board of water supply, New York; three contracts, 322, 323 and 324. Work also takes 95,000 linear feet, steel pipe for grouting, up to 2½-inch diameter, and 45,000 pounds, grating, ladders and steel stairs.

500 tons, Pulaski high school, Milwaukee.

275 tons, viaduct and roadway, East 135th street and Lincoln avenue, Bronx, N. Y.; bids Oct. 28, borough president, Bronx, N. Y.

225 tons, Dry creek bridge, Galt, Calif.; bids opened.

215 tons, Washington state Skagit river bridge; bids at Olympia Nov. 2.

200 tons, state span Madison county, Idaho; John Moser, Logan, Utah, low.

200 tons, mesh, Pennsylvania state letting; bids Oct. 29.

195 tons, highway, route 37, section 5, and route 40, section 1, Lakehurst, N. J..; bids Nov. 1, state highway department, Trenton, N. J.

190 tons, state highway bridge, Columbia county, New York.

150 tons, mesh and bars, highway project, route 4, section 36, Monmouth county, New Jersey; bids Nov. 1, state highway department, Trenton, N. J.

129 tons, plate girder bridge, Bucks county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Oct. 29.

109 tons, crossing, Livingston, Merced county, California; bids soon.

108 tons, dormitory, University of Iowa, Iowa City, Iowa.

105 tons, three bridges, Central Railroad of New Jersey, Elizabeth, N. J., bids in.

100 tons, dormitory, Western State Teachers college, Kalamazoo, Mich.; bids Nov. 2.

100 tons, dormitory, Purdue university, Lafayette, Ind.; bids Nov. 9.

100 tons, additional abutments, interstate high level bridge, La Crosse, Wis.; bids Oct. 29.

100 tons, building, Charles Andrews junior high school, Syracuse, N. Y.; bids in.

100 tons, warehouse, Pittsburgh & Lake Erie railroad, Pittsburgh.

100 tons, mesh, Montgomery county, Pennsylvania; bids Oct. 29.

100 tons, vegetable shed, Louisville & Nashville railroad, Cincinnati, O.

Unstated, King county, Washington, Kenmore bridge; bids at Seattle, Nov. 2.

Unstated tonnage, intercepting sewer, contract No. 18-A, Blue Island, Ill.; bids to Chicago sanitary district, Oct. 28.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 81

Bolt, nut and rivet specifications generally are unimproved despite occasional gains in needs of automotive interests. Demand from railroads and equipment builders is dull, with little prospect of any sustained improvement the remainder of the year. Farm equipment builders continue busy but are ordering for only a relatively short period ahead. Jobbers continue to specify sparingly.

Pig Iron

Pig Iron Prices, Page 82

Pittsburgh — Pig iron production and shipments are off in this district from the comparable September period. Thirty-five stacks are operating, against 48 in the middle of last month. With stocks well built up and demand light, it is likely that more furnaces may be shut down before the end of October. Export inquiry is not coming out in volume, although one inquiry for 5000 tons of foundry iron is reported.

Cleveland—While no definite announcement has been made regarding first quarter prices, it is generally expected that no adjustments will be made. Producers report sales this month have increased moderately. Shipments are ex-

FOR SALE

From Recent Dismantlements

Mills • Cranes • Boilers Buildings • Etc.

1—16″ Garrison continuous 6 stand Rod Mill including 2—continuous Heating Furnaces and run out tables. This mill can easily be Electrified and has Cast Steel housings.

1—16″ Garrison Rod Mill with 12″ 3 high pinions—Belgian Single Stand.

1—12″ Garrison Rod Mill train, 5 stand loop system—Complete with accessories.

1—10″ Garrison Rod Mill train 6 stand loop system—Has 12″ Pinions and all accessories.

1—6 Head vertical spindle hot wire coiling machine—Without Drive.

5—823 HP (NEVER USED) Babcock & Wilcox Boilers in perfect condition—150′ stacks, complete with building, stokers, coal and ash conveyors.

2—Scrap wire balers

2—No. 9 Sturtevant Blowers.

3—Skinner Heaters Baetz patent.

1—Buffalo Forge Blower.

1—600′ Ingersoll Rand compressor with 100 HP Sync. Motor. Type XRY, Air Reservoir, etc.

Several batteries of Tumbling Mills—Ask for list and Prices.

DC Motors—SK—K8—MC.

Shear Blades—ask for Prints.

1—130′ span Dravo Ore Bridge also suitable for 10 ton gantry crane or for handling limestone, coal, building material, etc. Built in 1923—used very little—a Fast outfit.

2—75′ Morgan Cranes 5 ton 230 volt DC—K8 Motors.

1—10 ton—230 volts DC—K8 Motor 40′ span Morgan Crane.

1—5 ton Morgan Crane 48′ span 230 volt DC—K8 Motor.

1—10 ton double chain Alliance Crane 230 Volt DC K8.

1—15 ton P&H Crane 39′ span 230 volt DC Motors.

BUILDINGS

1—75′ c/c Cols.—18′-6″ Bays—400′ long.

1—42′ center to center columns 82′ long.

1—106′ center to center columns 205′ long.

1—45′ center to center columns 50′ long.

1—31′ center to center columns 82′ long.

Ask for Prints of these Bldgs.

1 story building 200′ long, 20′ bays with a 80′ aisle, a 60′ aisle and a 40′ aisle. This building can be broken up to suit your requirements.

6—Chicago Pneumatic compressors Type N-502.

1—Union Air Compressor 12 x 12.

2—Dust Collector Systems complete.

2—Sand Blast units.

HETZ CONSTRUCTION CO., INC.

Phone 4474

GRISWOLD ST., WARREN, O.

pected to decline slightly as most foundries are intent on clearing up inventories. Requirements from auto foundries continue to show some improvement.

Chicago—Foundry operations have leveled off and pig iron shipments show no improvement. Deliveries compare favorably with a month ago and October is expected to equal September. Occasional lots are being received in new business as foundries steadily are curtailing stocks.

Boston—Pig iron imports are heavier, recent arrivals including 1200 tons of Dutch for Boston and 1500 tons for Bridgeport. The same ship also brought 1000 tons for Newark, N. J., and 650 tons for Philadelphia. Domestic buying remains sluggish, demand being for car-lot shipments or less, by smaller consumers. Melters with moderate supplies on hand are dipping into stocks, lowering inventory without much replacement covering. While machine tool and paper mill equipment needs are steady, foundries supplying other industries are melting less. The district pipe foundry, however, continues on a five-day schedule, one shift, with a fair backlog. Foreign inquiries now generally ask for concessions under the domestic market prices.

Philadelphia—Pig iron consumers show no anxiety over coverage since likelihood of price advance is regarded as remote. Some buying is being done but is of a fill-in character. Shipments, however, indicate activity has held up better in this area than elsewhere.

Buffalo — New buying in pig iron is confined almost entirely to immediate requirements. Shipments for October are about holding their own with the previous month.

Cincinnati — Buying of pig iron has dwindled to spot shipments, with further dullness evident in lightened specifications against orders. Preliminary estimates forecast the movement this month will be down from September levels.

St. Louis—Buying of pig iron has fallen to a few occasional cars, and shipments have also receded, so that present indications point to a smaller total for October than in September. The only transaction of any size was 1000 tons of northern iron taken by a Texas melter for delivery through the balance of the year. The melt is also developing recessionary tendencies in nearly all quarters, the only exception being in the case of farm implement and tractor plants, which are still going strong.

Birmingham, Ala.—No additional recession in production has developed although producers declare indications point to a slowing down. Shipments continue satisfactory.

Seattle—Since July 1, foundry operations have been tapering and pig iron demand has decreased. Price of Columbia iron, generally used here, $22 base, f.o.b. Provo, Utah, has been extended to Dec. 31. No foreign iron is coming in. English iron, formerly offered here at about $28, is now quoted at $50.

Toronto, Ont.—Business continues steady in Canadian pig iron markets, but lacks special features. Melters want iron for spot needs only and no forward delivery contracts were reported. Melters covered by contract, however, are taking delivery on schedule. Spot sales range from a car to 300 tons and repeat orders are appearing at frequent intervals. Daily melt is holding around 70 per cent, and while it is believed this rate will be maintained to Dec. 31, some doubt appears regarding prospects for 1938 after the first quarter. Steel plants are holding close to the capacity mark as a result of export contracts. Pig iron production continues at its peak level with six furnaces blowing, with output approximately 65 per cent of all Canadian capacity. Prices are firm.

Special Carbon and Alloy Spring Wire

IRON STEEL WIRE SENECA QUALITY

The demand for SENECA Quality Special Spring Wire is increasing rapidly.

We are prepared to meet all demands.

We can supply practically all grades in rounds and SHAPES and sizes from ½" to .004.

HIGHEST QUALITY GUARANTEED

Please send your inquiries with specifications

The Seneca Wire & Mfg. Company
FOSTORIA, OHIO

Established 32 Years

Scrap

Scrap Prices, Page 84

Pittsburgh — No 1 heavy melting is off $1.50 at $15.50 to $16 on a small sale into mill consumption. Railroad heavy melting is off $1.50 and all other grades are down. The market is at the lowest point since July, 1936, due to the prolonged absence of mill buying and other uncertainties.

Cleveland — Little activity is shown in steel and iron scrap. Some melters continue to accept shipments but others are holding back shipments. Quotations here are off 50 cents to $1 per ton and in the Valley in about the same proportion. Cast grades are unchanged.

Chicago—Scrap prices continue to weaken and heavy melting steel is off 75 cents a ton at $13.75 to $14.25. The current market is based largely on dealer-broker sales as new buying has been lacking following a purchase at $15. Activity in other grades also is quiet and prices share the weakness prevailing in heavy melting steel.

Boston—Scrap buying continues meager with the decline in prices not yet checked, an easy tone predominating. New England consumers are practically out of the market and lower prices on several cast grades have failed to move material. Demand for Pennsylvania shipment is also slack, buying being confined to a few specialties and some business in chemical borings at $9.25 to $9.50, f.o.b. shipping point. Export buyers are also less active, having covered on needs for current available cargo space.

With $14, dock, now being paid for No. 1 heavy melting steel for export, the price is off $5 a ton from the high for the year reached early last month. The entire list is weak and some of the specialty grades which have resisted mildly the decline are now definitely lower.

New York — Prices of scrap con-

tinue to sag and several dealers announce that beginning Oct. 25 their top price for No. 1 heavy melting steel for export dock delivery will be $13, the lowest price in months and nearly $4 under the peak price of the year. Other grades, including stove plate and No. 2 cast, are down $1 or more for export, with buying light and cargo space scarce. Domestic buying and shipments are at a standstill with prices on most steelmaking and foundry grades lower, though some are nominal for lack of transactions.

Philadelphia—The market for iron and steel scrap dwindled to practically imperceptible proportions. The leading interest is holding up shipments except from some smaller dealers and is making no offers against additional coverage. Some movement is noted to certain of the independents but even this has slowed down. Prices are largely unchanged, principally from lack of transactions on which to base them. However, inter-dealer transactions reveal that current quotations are generally reflective of the market.

Buffalo — With the leading consumer again placing an indefinite embargo on shipments, prices on iron and steel scrap have slipped 50 cents a ton to a nominal basis of $16 to $16.50 for No. 1 heavy melting material. No substantial tonnage sales have been reported here in the last month as the market is bare of firm bids. The influx of scrap to the mills following the partial lifting of the embargo Oct. 15 was so heavy that it was necessary again to clamp down on orders.

Detroit—Quotations have tumbled again, from 50 cents to $1 per ton, although prices continue to be only nominal since practically no buying has developed. Some dealers have begun to lay down tonnage as melters continue to remain out of the market.

One mill here has held up all water shipments and is taking deliveries on only two grades. This interest reports sufficient business on books to sustain capacity operations until after the first of the year.

Cincinnati — Most scrap grades are lower with new business in lightest volume of the year. Some melters who have been accepting considerable material throughout the price slide, are curtailing on the ground that scrap inventories are adequate for the present. Prices are nominal in view of the drop in demand and general market inactivity.

St. Louis—The descent in iron and steel scrap prices continues unabated. Latest cuts ranging from 25 cents to $3.50 per ton and affecting all grades, brings the average to the lowest point since the summer of 1936.

Trading has dropped to insignificant proportions. Melters take no interest and brokers and dealers have retired to await new developments.

Birmingham, Ala.—Lethargy continues in scrap. Usual large buyers are out of the market, and dealers have large accumulations.

Toronto, Ont.—Iron and steel scrap sales showed a minor decline for the week. The slump is credited to the fact that the railroads recently have offered substantial tonnages of steel scrap which has been absorbed by mills. Iron grades, however, continue in good demand. There has been some improvement in scrap offerings from rural districts, but this is in automobile scrap as well as lines that are not so active. Despite heavy shipments of scrap by dealers in recent months yard holdings again are on the upgrade.

Warehouse

Warehouse Prices, Page 83

Pittsburgh — Demand for warehouse products continues light, with the volume so far this month in some lines showing a decline from the comparable period of September. Greatly improved mill deliveries, with immediate shipment obtainable in many cases, have been reflected to some extent in the warehouse trade, although not as much as might have been expected.

Cleveland — Warehouse distributors are encouraged over the fact that tonnage booked this month has held on a par with September. Warehouse prices have held firm, particularly since mill prices are unchanged for first quarter.

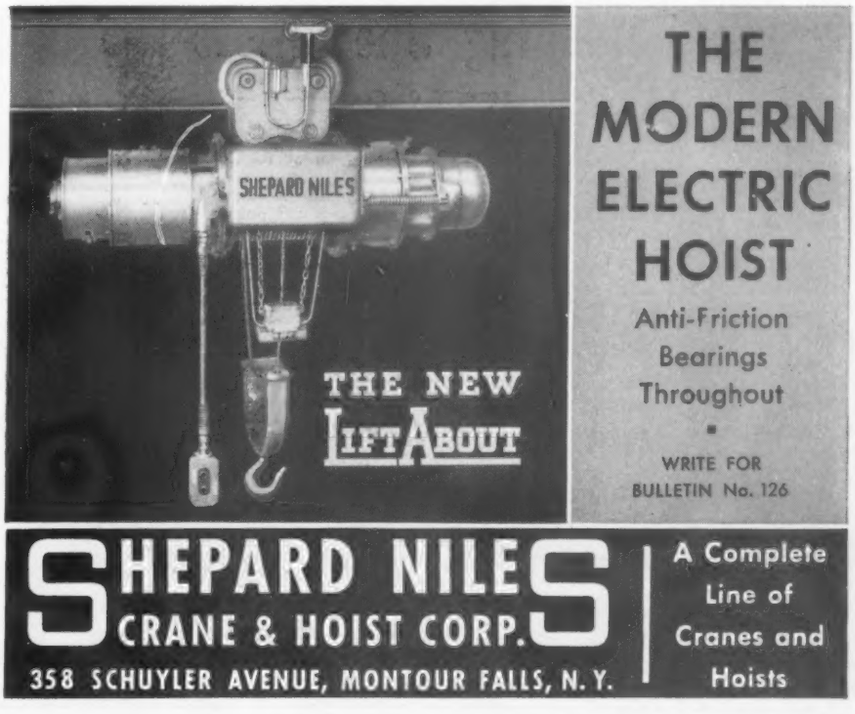
Chicago—Sales continue equal to the September rate and about level with business a year ago. While activity lags behind that of several months during first half, there has been little tendency toward a decrease such as experienced in mill orders. Prices are steady.

Philadelphia — Warehouse interests see additional business ahead, due to more interrupted mill schedules. The cost of production factor, it is believed, will divert more buying to jobbers. In the meantime, total number of orders is holding practically unchanged but total tonnage is under both last month and October, 1936. Prices are steady.

Detroit—Further recession in buying of warehouse iron and steel has developed, but not to the extent reflected in general business. Outlook for the balance of this quarter is gloomy, in view of the slump in steelmaking operations.

Cincinnati — Industrial needs form most warehouse demand, which varies only slightly from last month. Individual orders are small as buyers limit these to early needs.

St. Louis — Warehouse interests report business spotty, but holding up better than expected under the circumstances. There has been a


SHEPARD NILES
THE NEW
LIFTABOUT
THE MODERN ELECTRIC HOIST
Anti-Friction Bearings Throughout
WRITE FOR BULLETIN No. 126
SHEPARD NILES CRANE & HOIST CORP.
358 SCHUYLER AVENUE, MONTOUR FALLS, N. Y.
A Complete Line of Cranes and Hoists

pick-up in specifications and improvement in new buying by the general manufacturing trade.

Seattle—Sales continue light. Generally unsatisfactory business conditions are blamed for the recession since July 1. Light gage sheets are in best demand. There is practically no mill buying. Prices continue firm.

Steel in Europe

Foreign Steel Prices, Page 83

London—(*By Cable*)—Prospects in the British domestic steel trade continue promising, although new business is quiet in view of extended deliveries. An increase in prices is expected at the end of the year. Entire steel and iron production is going immediately into consumption. Exports of pig iron, except hematite, have practically stopped. Arrivals of semifinished steel from the Continent are larger, giving rerollers a better supply. Galvanized sheet exports are dull and the tin plate market is quiet.

Imports of steel and iron products in September showed an increase of 12,769 tons over August, with a total of 226,190 tons. This is due largely to receipts of semifinished steel from the Continent and scrap and pig iron from other sources. Exports declined 7737 tons, from 201,352 tons in August to 193,615 tons in September.

The Continent reports export trade dull with some Manchurian and Japanese inquiries. American competition in world markets is increasing.

Iron Ore

Iron Ore Prices, Page 84

Cleveland — A report recently issued by M. A. Hanna Co., discloses the accelerated rate at which ore carriers operating on the Great Lakes are being laid up. Of the total 311 vessels, 235 were in commission Oct. 15, compared with 307 a month ago and 278 on Oct. 15, 1936. While on Sept. 15 all the boats in commission were being used in the ore trade, only 225 carriers were reported Oct. 15. Of the 21 steamship companies covered in the report, fleets of eleven remained in 100 per cent operation. However, since Oct. 15 some vessels of these fleets have become inactive.

Stocks of iron ore at the lower lakes ports and furnaces Oct. 1, were approximately 8,000,000 tons more than on the comparable date last year, illustrating one reason why lake shipping activity is rapidly drawing to a close. The Lake Superior Iron Ore association's report follows:

	Tons
Consumed in August	5,373,264
Consumed in September	5,157,411
Decrease in September	215,853
Consumed in September, 1936	4,026,690
On hand at furnaces Oct. 1	34,826,601
On Lake Erie docks Oct. 1	5,127,000
Total on hand at furnaces and Lake Erie docks Oct. 1	39,953,601
Reserve total Oct. 1, 1936	31,977,663

Heading Specialists
Special screws of great variety made to order
Quality rivets and studs from all grades of materials to order only for other manufacturers.
Progressive Manufactured Products are made on both a quality and price basis, their uniformity of construction insures you against slowing down in your assembly operation.
Manufacturers learn to admire business concerns for what they are and what they do, a great many parts now made on screw machines lend themselves to heading which results in great savings and improved service. Have our specialists consult with you, our service is free and we might suggest something that may prove of considerable importance to you.
THE PROGRESSIVE MFG. COMPANY
Torrington, Conn., U. S. A.
IN STOCK AT ALL TIMES — Standard Machine Screws— Machine Screw Nuts — Interchangeable bolts and nuts made strictly to A.S.M.E. tolerances
THE PROGRESSIVE MFG. CO.
QUALITY
PROMCO
BRAND
TORRINGTON, CONN. U.S.A.

Metallurgical Coke

Coke Prices, Page 81

H. C. Frick Coke Co. has closed its Crossland plant in the Connellsville, Pa., beehive district. With 120 ovens, Crossland was the last of the company's beehive plants operating in the district. Wieman & Ward Co. has put in 125 more ovens at Oliver, making about 250 ovens in for this company. Demand continues light. In the Pittsburgh district blast furnace operations have slumped, only 35 stacks operating, compared to 48 a month ago.

Cold Finished

Cold Finished Prices, Page 81

Pittsburgh—Leading sellers have reaffirmed current prices on alloy and carbon cold-finished bars for first quarter. Cold-finished bar orders so far this month show bookings about even with the comparable portion of September, but at about 50 per cent of the average of the preceding six months. One or two producers report that they are slightly ahead of the dull September period. Hand-to-mouth buying is maintained and the disappointing shrinkage of specifications from the automotive industry has been notable.

Refractories

Refractories Prices, Page 82

Pittsburgh — Shipments against previous refractory bookings are maintained, but new business has been light and orders are insufficient to continue present schedules following the completion of contracts. A number of improvement programs are being delayed until the present general business uncertainty is further clarified, according to refractory makers. Quotations are unchanged.

Much Ore Imported

Philadelphia — Ore importations here during the week ended Oct. 16 were substantial, involving 8150 tons of manganese ore from British West Africa and 150 tons from British India; also 9400 tons of chrome ore, of which 5000 came from the Philippine Islands and 4400 from South Africa. Another feature was the arrival of 1787 tons of pig iron from British India.

Steel importations comprised 132 tons of bars, 118 tons of structural shapes and 13 tons of bands from Belgium, 47 tons of tubes, 22 tons

of wire rods, 11 tons of forgings and 30 tons of bars, from Sweden; and 19 tons of shapes and five tons of bands from France.

Officers Elected by Copper, Brass Group

F. S. Chase, president, Chase Brass & Copper Co. Inc., was elected president of the Copper and Brass Research association at its sixteenth annual meeting in New York, Oct. 21. Other officers elected are: Vice presidents, John A. Coe, president, American Brass Co.; C. D. Dallas, president, Revere Copper & Brass Inc.; Wylie Brown, president, Phelps Dodge Copper Products Corp.; treasurer, C. D. Dallas; secretary, Bertram B. Caddle.

The following were elected to the executive committee: J. A. Doucett, Revere Copper & Brass Inc.; R. L. Coe, Chase Brass & Copper Co. Inc.; F. E. Weaver, American Brass Co.; Wylie Brown; W. M. Goss, Scovill Mfg. Co.; H. W. Steinkraus, Bridgeport Brass Co.

The board of directors elected includes members of the executive committee and the following: F. S. Chase, C. D. Dallas, John A. Coe, R. E. Day, Bridgeport Brass Co.; E. O. Goss, Scovill Mfg. Co.; J. P. Lally, C. G. Hussey & Co.; C. C. Limbocker, Wolverine Tube Co.; H. A. Staples, Phelps Dodge Copper Products Corp.; F. L. Riggin, Mueller Brass Co., and Bertram B. Caddle.

Air Conditioning Opens Broad Engineering Field

Recent investigation and studies have proved that the air conditioning industry is in a position to absorb between 5000 and 7000 newly trained men per year for the next ten years, is the statement of A. E. Allen, vice president of Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. The occasion was the opening of an air conditioning application school in session for a month at East Springfield, Mass. It is being attended by 70 engineers in the employ of distributors of Westinghouse air conditioning equipment.

California Foundrymen Guests at Fresno Party

Foundrymen and their wives from the northern and southern districts of California attended an informal party in Fresno, Oct. 9 as guests of M. G. Wilson, Wilson & Nutwell, new member of the Northern California chapter of the American Foundrymen's association. Forty-five were present.

Robert Gregg, chairman, Southern California chapter, headed the delegates from the South, and John D. Fenstermacher, vice chairman, Northern California chapter, those from the North. Charles Hoehn, a national director and chairman of the Northern California chapter, was unable to be present because of illness.

Foundrymen were urged to attend the Del Monte conference of Iron, Steel and Allied Industries, Feb. 10, 11 and 12.

1600 Visit Pangborn Plant on Family Day

More than 1600 employes and members of their families visited the plant of the Pangborn Corp., Hagerstown, Md., Oct. 2, family visit day. All employes were given a holiday with pay and were invited to bring their families to the plant for the occasion.

Guests were welcomed by Thomas W. and John C. Pangborn, inspected the entire plant, were served lunch, candy, cigars, cigarets and soft drinks. Many door prizes ranging from a 10-tube radio to electric clocks and irons were distributed.

25,000 at Weirton Plants for Open House

Approximately 25,000 persons visited the six Weirton, W. Va., and Steubenville, O., plants of the Weirton Steel Co. during open house held Oct. 13 and 14. Although many of the visitors were from foreign countries or from distant points in the United States, the majority were from the immediate Weirton-Steubenville district. Many were employes who took this opportunity to visit departments other than those in which they are employed.

The visitation was extended three hours beyond the scheduled closing time to accommodate the crowd. Three hundred company employes served as guides.

Payrolls Rise Faster Than Steel Production

Monthly payrolls in the steel industry in 1937 increased at a faster rate than steel output, following a four-year period when the payrolls and output were closely related, according to the American Iron and Steel institute.

The step-up in the payroll increase came in March this year, with an average wage advance of 18 per cent.

From September, 1933, until March this year monthly changes in the volume of wages and output were in close correlation, the spread between dollar volume of wages and volume of steel output averaging less than 8.5 points.

Since March, monthly payrolls have continued to reflect fluctuations in the volume of production, but charts show the spread between payrolls and production has averaged nearly six times as much as the average in preceding months.

In August $77,570,000 was paid to

THE HANNA FURNACE CORPORATION
MERCHANT PIG IRON DIVISION OF NATIONAL STEEL CORPORATION
Buffalo Detroit New York Philadelphia Boston

wage-earning employes, more than 160 per cent above the total of $29,608,000 in September, 1933. Over that 48-month period, output of steel ingots increased only 113 per cent, rising from 2,283,079 gross tons in September, 1933, to 4,875,671 gross tons in August, 1937.

The number of wage earners in August was 541,000, highest in the history, and about 42 per cent above September, 1933.

LABOR BOARD HEARINGS DRAWING TO CLOSE

The national labor relations board completed its case in Johnstown, Pa., against Bethlehem Steel Co. last Wednesday and the hearing recessed until Tuesday, Oct. 26, at Allentown, Pa.

At New Cumberland, W. Va., the labor board's case against Weirton Steel Co. also was nearing its close after many weeks.

Counsel for Weirton Steel Co. last week announced that the board had refused permission to subpena officers of the Weirton SWOC lodge, with membership applications, cards, and other records.

The company pointed out that it was attempting to refute the SWOC's claim to be a labor organization and to prove SWOC did not represent 7500 Weirton employes as is claimed.

Nonferrous Metals

Nonferrous Metal Prices, Page 82

New York — Nonferrous metal prices broke sharply in the London market last Tuesday, influenced to some extent by the drop in security values, but worked steadily into higher ground later in the week on heavy purchases. Lead declined $5 per ton on Monday while tin fluctuated widely from day to day.

Copper — Custom smelters continued to quote electrolytic at 12.00c, Connecticut, while primary mine producers held at 13.00c. Scrap prices declined sharply in line with the foreign market early in the week and made a partial recovery toward the end. Export copper eased to 10.75c, c.i.f. but closed around 11.30c.

Lead — Demand increased with sellers more than balancing ore intakes after midweek. Prices advanced Monday to 5.35c, East St. Louis, and 5.50c, New York. Refined stocks at the end of September were reported at the lowest level since November, 1930, totaling only 90,742 tons.

Zinc — Activity was dull but prices held at 6.00c, East St. Louis. Pressure for deliveries has lifted noticeably.

Tin — Straits spot fluctuated from 48.37½c to 50.87½c and closed around 49.62½c. Consumers bought heavily at the lower levels.

Antimony — Strength in this metal in the face of general price weakness was demonstrated again last week. American spot advanced to 17.25c while Chinese spot held at 18.25c.

Equipment

Pittsburgh — Bids will be opened by United States engineers at Kansas City Dec. 3 for completion of the main control shafts for the Fort Peck tunnel, including manufacture and installation of the main control (cylinder) gates and control apparatus. Hagan Corp., Pittsburgh, will install complete automatic control for three boilers in the Niagara Falls plant of International Paper Co. Furnace pressure control for four additional boilers in the plant will also be installed. The company also will install combustion control in the plant of the Taggart Oswego Paper Co., Oswego, N. Y. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., last week was awarded substation equipment by the Tennessee Valley authority, at $42,900.

Seattle—Business is quiet, in sympathy with recession in economic conditions. Electrical equipment and pumping machinery are in good demand and manufacturers of diesel engines report fair sales.

Construction and Enterprise

Illinois

CHICAGO — Western Electric Co., Cicero avenue and Cermak road, plans constructing two-story plant, cost of which will exceed $40,000.

CHICAGO—Frank Mattern Co., 4647 North Cicero avenue, has let general contract to E. A. Borg Co., 2200 Lunt avenue, for erection of one-story, 100 x 100 feet, factory addition. Estimated cost $40,000.

CHICAGO—Chicago Die Casting Co., 2512 West Monroe street, has let general contract for two-story factory addition to Adams & Schroeter Co., 201 North Wells street. Cost estimated between $35,000 and $40,000.

CHICAGO—E. V. Buchsbaum, architect, 7225 Jeffrey avenue, will soon let contract for constructing one-story addition, 100 x 200 feet, to factory of Precision Scientific Co., maker of gas testing instruments, estimated to cost $65,000.

ROCKFORD, ILL.—Mechanics Universal Joint Co., subsidiary of Borg-Warner Corp., 310 South Michigan avenue, Chicago, plans installation of motors, controls, conveyors, electric hoists and other equipment in new one-story plant here. Cost close to $450,000. (Noted Sept. 20.)

Ohio

CINCINNATI — Hilton Davis Chemical Co., Langdon road and Pennsylvania

SOLVED!
Where to stay in
CLEVELAND
600 large, modern rooms with bath and circulating ice water.
3 air-conditioned restaurants.
HOTEL CARTER
CLEVELAND, OHIO
Fay M. Thomas, *Manager*

railroad, plans new office and laboratory buildings. Will purchase new equipment.

DAYTON, O.—Midwest Tool & Engineering Co., 112 Webster street, maker of tools and dies, has awarded general contract to I. F. Weber & Co., Commercial building, for erection of one-story addition, 50 x 100 feet. Cost over $45,000 with equipment.

HAMILTON, O. — National Can Co., 110 East Forty-second street, New York, will spend about $40,000 for improvements to its plant here.

ZANESVILLE, O. — Burley Bros. Pottery Co. will rebuild its pottery plant. Cost to exceed $40,000.

Michigan

DEARBORN, MICH. — Ford Motor Co. plans installation of motors and controls, conveyors, regulators, electric hoists and other equipment in new additions to its River Rouge plant. Cost over $200,000. Giffels & Vallet Inc., Marquette building, Detroit, consulting engineer. (Noted Oct. 4).

ONTONAGON, MICH. — Ontonagon County Rural Electric association, John Franti, president, has engaged Toltz, King & Day Inc., Pioneer building, St. Paul, as engineers for construction of 150 miles of rural transmission lines with $150,000 REA funds.

Connecticut

HAMDEN, CONN.—Whitney Blake Co., manufacturer of insulated wire, Dixwell avenue, plans erecting a factory addition. Cost estimated at $125,000.

Massachusetts

BOSTON — National Can Co., 110 East Forty-second street, New York, plans improvements to its plant here as part of its $550,000 expansion program. Cost to exceed $40,000.

CHARLESTOWN, MASS.—H. P. Hood & Sons Inc., 500 Rutherford avenue, will soon let contract for one-story, 44 x 70 foot boiler house. Estimated cost with equipment $40,000. Gauteaume & McMullen, 99 Chauncy street, Boston, architects.

Rhode Island

PROVIDENCE, R. I.—Circular Tool Co. Inc., 765 Allens avenue, has begun work on a one-story plant, 100 x 168 feet, and an addition to its present factory.

New York

GOUVERNEUR, N. Y.—Rushmore Paper Mills plans to rebuild its paper mill recently destroyed by fire. Estimated cost $40,000.

MASPETH, N. Y. — National Can Co., 110 East Forty-second street, New York, will spend approximately $40,000 for improvements to its plant here, as a part of its $550,000 expansion program.

New Jersey

NEWARK, N. J. — Celluloid Corp., Ashby and Dearcy streets, plans repairs and alterations to its plant. Estimated cost $40,000.

TRENTON, N. J. — Crescent Insulated Wire & Cable Co. is building a two-story factory addition for which it has awarded general contract to N. A. K. Bugbee Co., 206 East Hanover street, Trenton. Cost $32,000.

Pennsylvania

PHILADELPHIA — Edward G. Budd Mfg. Co., Huntington Park avenue, has let contract to Wark Co., 1608 Walnut street, for erection of plant addition, estimated to cost $80,000.

Alabama

MOBILE, ALA.—Standard Oil Co. has permit for expenditure of $42,000 for erection of tanks, loading racks, installing pipe lines and dock construction on and adjacent to its property here.

MOBILE, ALA. — State docks commission has authorized expenditure of $45,000 for enlarging belt conveyor system at docks bulk handling plant, which will double present capacity.

Maryland

BALTIMORE—American Brake Shoe & Foundry Co., Fulton station, is taking bids for erection of one-story addition and improvements to its present plant. Estimated cost over $40,000, including equipment.

District of Columbia

WASHINGTON—Purchaser in Bolton, England, is in the market for structural steel bars. For information refer to bureau of foreign and domestic commerce, trade opportunity 4287.

WASHINGTON—Bureau of domestic and foreign commerce, trade opportunity 4289, reports that agency at The Hague, Netherlands, would like to handle wire, wire netting, barbed wire and nails.

WASHINGTON—Bureau of supplies and accounts, navy department, will take bids until Oct. 29, schedule 1885, for seamless carbon-molybdenum steel tubing; schedule 1888, seamless steel tubing; schedule 1897, one motor-driven pipe threading machine, delivered Washington; schedule 1909, alloy bar steel, delivery Philadelphia; until Nov. 2, schedule 1887, one motor-driven power squaring shear, delivery Norfolk, Va.; schedule 1891, corrosion-resisting steel welding electrodes (covered); schedule 1905, 2475 pounds of nickel-copper alloy forging, delivery Washington; schedule 1918, eight pneumatic trolley type hoists, delivery Portsmouth, N. H.

Kentucky

SOMERSET, KY. — City plans municipal light and power plant, cost of which will exceed $50,000.

Georgia

ATLANTA, GA. — City, Lloyd A. Walker, purchasing agent, receives bids Nov. 8 on $250,000 waterworks improvement project, consisting of construction of 11 new 3,000,000-gallon filter units and purchase of new pumping equipment to replace obsolete and broken machinery. Wiedeman & Singleton, engineers, 1404 Candler building, Atlanta.

North Carolina

WHITESVILLE, N. C.—Glanton Veneer Co. is considering erection of a veneer factory, estimated to cost $50,000.

South Carolina

YORK, S. C.—REA, W. J. Hauck, development engineer, will construct 80 miles of power lines in York county. Allotment of $75,000 has been granted.

Louisiana

BATON ROUGE, LA. — Standard Oil Co. of Louisiana, 2134 St. Charles avenue, New Orleans, plans addition and auxiliary equipment estimated to cost $3,000,000 to its plant here.

Virginia

HERNDON, VA. — Town, Russell A. Lynn, mayor, takes bids Oct. 29 for constructing water distribution system, including elevated tank, pump and appurtenances. Chester Engineers, Century building, Pittsburgh, are engineers.

NORFOLK, VA.—H. B. Hunter Co., 150 Brown avenue, maker of industrial chemicals, has let general contract for

THE STARTING POINT *of*

NF

FORGINGS

CARBON-ALLOY AND SPECIAL BASIC ELECTRIC STEELS

COMPLETE control of all processing from selection of the melting charge to the finished condition is the N. F. & O. *guarantee of quality* in forgings furnished to your specifications — Smooth Forged, Hollow Bored, Rough or Finish Machined.

Die Blocks and Piston Rods

NATIONAL FORGE AND ORDNANCE CO.

IRVINE, WARREN COUNTY, PENNA., U. S. A.

one-story addition to W. T. Gregory, Flat Iron building. Cost $40,000, including equipment.

Oklahoma

MARLOW, OKLA. — City plans installing 700-horsepower diesel engine and generator in city light plant. Estimated cost $50,000.

PURCELL, OKLA. — City will spend approximately $75,000 for installing 1000-horsepower diesel engine and generator in city light plant.

TULSA, OKLA. — City, W. F. Graham, water commissioner, T. A. Penney, mayor, is considering plans for extensions and improvements to distribution system. Estimated cost $600,000.

Wisconsin

KENOSHA, WIS.—Arneson Foundry Co., 6412 Thirty-third avenue, maker of iron and steel castings, will enter the nonferrous casting business through newly organized affiliate, headed by Thomas Arneson Jr. New plant is being built at 3417 Fourteenth avenue.

LADYSMITH, WIS.—R. J. Clark Motor Co. has plans by E. F. Klinger, Amery, Wis., architect, for new automotive sales and service station, 132 x 135 feet, estimated to cost $40,000.

MILWAUKEE—H. Barkow, 153 North Milwaukee street, maker of motor truck bodies, hoists, etc., will build a factory addition, 40 x 75 feet.

MILWAUKEE—International Harvester Co. is building a new gas compressor building, 34 x 136 feet, at its Milwaukee works, 1640 West Bruce street.

MILWAUKEE—Independent Milwaukee Brewery Co., 2701 South Thirteenth street, Milwaukee, has let contracts for additions to storage room, bottling house, cellar rooms, etc., estimated to cost $100,000. H. N. Bills is president.

MILWAUKEE—Le Roi Co., 1706 South Sixty-eighth street, maker of industrial gasoline and oil engines, air compressors, etc., has leased 25,000 square feet in a factory group adjacent to its plant, space to be used mainly for compressor assembly, testing, etc. Charles W. Pendock is president.

WAUSAU, WIS.—Mathie-Ruder Brewing Co. will make extensive improvements to brewery, including installation of new bottling, filling and pasteurizing equipment, alterations to malt house and other improvements, to cost about $35,000.

WISCONSIN DELLS, WIS.—City plans construction of a two-story municipal shop building, 40 x 60 feet. Kenneth Schanke is city clerk. John J. Flad, Cantwell building, Madison, Wis., is architect.

Minnesota

WORTHINGTON, MINN. — Boote's Hatcheries & Packing Co., J. C. Boote, president, plans construction of a packing plant, including killing and cold storage plants.

Texas

MOUNT PLEASANT, TEX. — City voted $90,000 waterworks bonds. Improvements will include erection of filtration plant and installation of new machinery.

SAN ANTONIO, TEX. — Roegelein Packing Co., W. Roegelein, president, 1701 South Brazos street, will erect a packing plant, and will purchase machinery and equipment. Estimated cost $60,000.

SAN ANTONIO, TEX.—Carle Gasoline Co., San Antonio, plans to enlarge and improve the gasoline plant it recently acquired from the Ranne Refining Co. Erection of a cracking unit also is planned. Cost estimated at $80,000.

Kansas

LAWRENCE, KANS. — Kansas Electric Power Co. is considering erection of power generating plant, costing $1,000,000. Sargent & Lundy, 140 South Dearborn street, Chicago, engineers.

PEABODY, KANS.—City is making preliminary survey on plans for construction of municipal light and power plant to cost between $75,000 and $100,000. E. T. Archer & Co., 609 New England building, Kansas City, Mo., consulting engineers.

South Dakota

ESTELLINE, S. DAK.—City has begun construction of a municipal light and power plant and will install a two-unit diesel plant. A. J. Lundberg is city auditor.

Iowa

HAMPTON, IOWA—Hampton Machine & Tool Co. has started construction of a new one-story machine shop, 50 x 70 feet.

WATERLOO, IOWA — John Deere Tractor Co. has started construction of an addition to the foundry building at the tractor manufacturing works. L. A. Rowland is vice president and general manager.

WAUKON, IOWA—City council has appointed Walter H. Cullen and C. F. Bartels as consulting engineers to draw plans for construction of a sewage disposal plant and water treatment plant.

Nebraska

ALLIANCE, NEBR. — City, Clarence Hoper, manager, will take bids soon for construction of power plant addition, including a 2000-kilowatt turbine, surface condenser, new boilers and boiler plant equipment to cost $242,700. Black & Veach, 4706 Broadway ,Kansas City, Mo., is consulting engineer. (Noted Sept. 27.)

OMAHA, NEBR. — American Steel Drum Manufacturers Inc. has been incorporated with capital stock of $25,000, by C. W. Williamson, Henry F. Wanek and J. C. Holly.

Montana

FORT PECK, MONT.—United States government, war department, office of division engineer, 707 Postal Telegraph building, Kansas City, Mo., will take bids Dec. 3 for completion of the main shafts for the diversion tunnels at the Fort Peck dam, which will include the use of 491 tons of plate steel liners, 900 tons of semi-steel port liner castings, 1500 tons of reinforcing steel, 100 tons of miscellaneous structural steel, two upper and four lower main control gates, mechanical operating machinery for six main control gates, four cranes for main control shaft buildings, electric equipment for main control gate operating machinery, etc.

Utah

MANTI, UTAH — Municipality plans electric power plant improvements, costing $50,000.

Pacific Coast

LOS ANGELES—Plans are under way for construction of an assembly plant here for the Packard Motor Car Co., Detroit. No site has yet been selected, but it will be built in the industrial area of South Gate. It is reported that work will be started within 90 days, and that the plant will cost approximately $1,000,000.

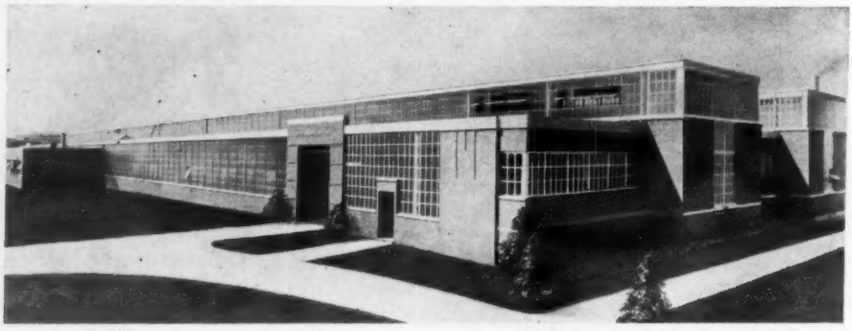
SAN DIEGO, CALIF. — Consolidated Gas & Electric Co., Electric building, has plans under way for new indoor type power substation at Front street and Robinson avenue. Cost close to $50,000 with transformers and auxiliary equipment.

NYSSA, OREG. — Amalgamated Sugar Co., Ogden, Utah, plans installation of motors and controls, conveyors, power substation equipment, electric hoists, loaders and other equipment in new beet sugar mill here. A power house also will be built. Cost $2,000,000.

Canada

FORT WILLIAM, ONT.—Canadian Car & Foundry Co. is reopening its plant, idle for more than 15 years, to manufacture airplanes for the Turkish government.

TORONTO, ONT.—Canada Cycle & Motor Co. Ltd. is building an addition to its Weston plant at a cost of $45,000.



NEW $700,000 factory of the Ohio Crankshaft Co., Cleveland, will double the company's present capacity for machining and Tocco-hardening of crankshafts and other automotive parts. The building, at East Forty-second street and Harvard avenue, will provide 75,000 square feet of floor space and employment for an additional 300 workmen. Through an error in mechanical makeup another photo was published in the Oct. 18 issue as that of the Ohio company's new building

Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

Filter Facts

To the Editor:

In reading the Oct. 11 copy of STEEL we note on page 68 comments concerning an interesting new development in automotive accessories, the use of an engine filter using fullers earth as a medium of filtration.

This type of filter is not new. It is copied to some extent after the operations in oil refineries where they use fullers earth as an activated clay for correction of certain impurities in crude oils. This has been followed by several organizations using fullers earth either in a bag or in a cake form, with a binder, as a medium for filters on engines, and it has a very distinct sales advantage of giving a bright color to the oil.

So far as the benefit of this over the use of the normal depth filters, it is still very highly questionable. We can discuss this matter frankly in that we do not make either of these types of filters, but as we are furnishing the super-filter units used in extremely heavy duty operations, we are in position to be acquainted with such developments.

PAUL WILLIAMS.
Skinner Purifiers Inc.,
Detroit.

Comfort Yields Profit

To the Editor:

In connection with the articles on unit heating of industrial plants, in STEEL, June 28 and July 5, we have not been able to make any definite observations or reach any conclusions as to the measurable effect on production and costs from maintaining comfortable temperatures both in winter and summer, particularly as regards the application of unit heaters. I might say that we found it necessary to install unit heaters in our plant in order that there might be uniform heat during the winter months, but we have not attempted to maintain any particular temperature in summer.

As to what the effect on production and cost may be, I can only say that we naturally expected to obtain more and better work when our shop was comfortably heated than we did where there were cold spots and the workmen were uncomfortable. We did not attempt to find whether there was any added production or decreased cost, but satisfied ourselves mainly in that our men had comfortable and satisfactory working conditions.

E. C. BULLARD.
Vice president and general manager,
The Bullard Co.,
Bridgeport, Conn.

In Touch Through STEEL

To the Editor:

Going round the world in one's own armchair long has been an indoor sport that costs little and is much enjoyed. Reading STEEL this week (Oct. 25), I felt that I had been taking a tour of the conventions of many of the most important metal associations of the country, so fully and succinctly were they covered.

To the stay-at-homes who are unable, financially or physically, to attend these gatherings, STEEL is an unfailing source of pleasure, with its clearcut accounts of the sessions and presentation of familiar faces of the leaders. It gives opportunity to keep pace with the advances in the metal industry. It is like renewing contact with the men who are doing things. Unable to attend these conventions but deeply interested in their discussions, I revel in your covering of the sessions.

Incidentally, I may say also that your advertising pages present a huge fund of information in the metallurgical field, with the new developments, new alloys and processes set forth by their sponsors in a way to further the education of the stay-at-home. It is difficult to choose, sometimes, between the interest in the advertising and reading-matter pages.

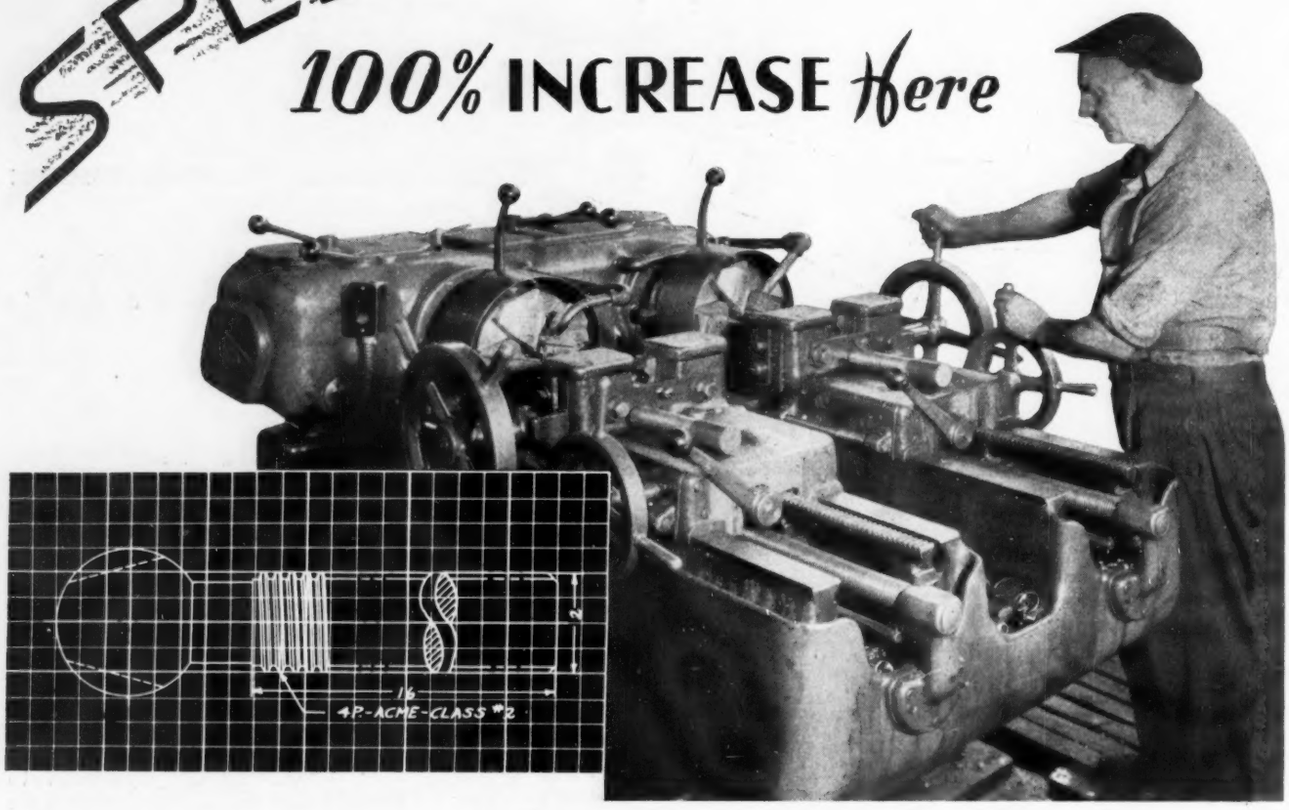
INTERESTED.

Chicago.

EDITOR'S NOTE—The above writer speaks from knowledge as the Oct. 25 issue of STEEL carried reports of ten conventions, scattered over the eastern half of the country and considering a wide diversity of subjects. In all, 13 pages of text and illustrations were devoted to this phase of the industry, giving a broad picture of progress and reflecting business sentiment.

SPEED is PRODUCTION

100% INCREASE Here



The Duff Norton Mfg. Co., Pittsburgh, Penna., use *speed* for increasing production 100% when threading ditch brace screws.

They use the *speed* of the new LANDMACO Threading Machine on these 2" diameter 4 pitch *Acme* threads, and they obtain an excellent quality of finish.

They use the fast free cutting action of the LANDIS Patented Tangential Chaser, and have less down time for tool grinding or size adjustment.

They take advantage of the ease with which LANDMACO Machines operate for still more speed.

Why not employ the speed of LANDMACO Threading Machines to solve *your* production problems? Write us.

LANDIS CHECK ✓ BOOK

. . . are you handling your threading jobs efficiently?

. . . . . The Check Book will tell you!

Write for your copy today

LANDIS MACHINE CO., INC.

Waynesboro, Penna.